CHAPTER 3
AFFECTED ENVIRONMENT

INTRODUCTION

This section presents the existing conditions for resources potentially affected by the Proposed Action. The project area is located in Washoe County and includes public and private lands, incorporates the cities of Sparks and northern Reno (Figure 1-1). To better understand the condition of resources that could be affected by the Proposed Action and alternatives, a study area was delineated. The study area encompasses a 150-foot zone on each side of the transmission line centerline, staging areas, and substation sites. In regions that have steep slopes and may have additional disturbance, the study area is enlarged to 300 feet on each side of the transmission line. The location of the 600-foot study area is shown on the maps for the Proposed Action and alternatives in Chapter 2.

In Accordance with FLPMA and NEPA, this document has been prepared with input from and coordination with the cooperating agencies, in addition to other interested agencies, organizations, and individuals within the region (Chapter 6). During the scoping process, input and issue identification was solicited from key agencies and groups with special expertise, interest, or administrative responsibility pertaining to the general geographical area. Based on this input and recommendations from BLM resource specialists, the following resources were determined to be potentially affected by the Proposed Action and carried forward for detailed analysis:

- Land use and realty;
- Geology and soils;
- Water resources;
- Vegetation;
- Invasive nonnative species;
- Wildlife and wildlife habitat;
- Special status species;
- Range resources;
- Aesthetics (visual and noise);
- Hazardous materials;
- Public health and safety;
- Air resources;
- Recreation and areas of critical environmental concern (ACEC);
- Socioeconomics and environmental justice; and
- Cultural resources and Native American religious concerns.

Appendix 5 of the BLM NEPA Handbook (H-1790-1, 1988) identifies Critical Elements of the Human Environment. The appendix lists resources that are subject to requirements specified in statutes or executive orders and must be considered in all BLM environmental documents. Table 3-1 lists the designated critical elements, where they are addressed in the EIS, and provides reasons why certain elements are not carried forward for detailed analysis.

LAND USE

This section discusses the current land ownership and use within the study area for the proposed route and alternatives. The project area is located within Washoe County, which is centrally located in western Nevada (Figure 1-1). Population centers in the project area include the cities of Reno and Sparks plus unincorporated areas of Washoe County.

Land Status

Land jurisdiction in the project area includes private, county, city, Native American, and public lands used for a variety of purposes (see Figure 1-1). As shown in Table 3-2, between 13 and 42 percent of the lands

Table 3-1
Critical Elements Carried Forward for Analysis

Critical Element	Corresponding EIS Section
Air Quality	Air Resources
Areas of Critical Environmental Concern	Recreation and ACECs
Cultural Resources	Cultural Resources and Native American Religious Concerns
Environmental Justice	Socioeconomics and Environmental Justice
Farmland (prime or unique)	No prime or unique farmland is present or under production on public lands within the project area.
Floodplains	Water Resources
Hazardous Materials	Hazardous Materials
Invasive and Nonnative Species	Invasive and Nonnative Species
Migratory Birds	Wildlife and Wildlife Habitat
Native American Religious Concerns	Cultural Resources and Native American Religious Concerns
Paleontology	Cultural Resources and Native American Religious Concerns
Threatened and Endangered Species	Special Status Species
Water Quality (Surface/Ground)	Water Resources
Wetlands/Riparian Zones	Vegetation
Wild and Scenic Rivers	No wild and scenic rivers or potentially eligible rivers are within the project area.
Wild Horse and Burros	No federal herd management areas occur within the project area.
Wilderness	No designated wilderness or wilderness study areas are within the project area.

Table 3-2
ROW Distances on Public and Private Land

Routes	Total Length of ROW (miles)	Length of ROW on Public Land (miles)	Percent of ROW on Public Land	Length of ROW on Private Land (miles)	Percent of ROW on Private Land
Proposed Action	34	12	35%	22	65%
Northern Alternative	46	13	28%	33	72%
Calle de la Plata Alternative	36	12	33%	24	67%
Foothills Alternative	38	16	42%	22	58%
Southern Alternative	35	11	31%	24	69%
Existing Corridor Alternative	38	5	13%	33	87%

along the ROWs are owned by the BLM; the remaining lands are administered by Washoe County, the City of Reno, the City of Sparks, Reno-Sparks Indian Colony, and private parties.

On public lands, BLM has authorized use for utilities and access roads. Mineral resources and mining are subject to valid existing rights. There are several tracts of BLM land in the Proposed Action area that have been designated for disposal for use by state

and local government for recreation. (This topic is discussed further in the Recreation and Areas of the Critical Environmental Concern section of this document.)

The Washoe County Comprehensive Plan categorizes utility buildings and facilities as nonresidential public and semipublic facilities. Land use adjacent to public and semipublic facilities must be compatible with these types of facilities. The public facility designation is most compatible with the following land use designations (Washoe County 2003d):

- Low density urban;
- Medium density urban;
- High density urban;
- Parks and recreation;
- General commercial;
- Office commercial; and
- Tourist commercial.

The Washoe County Comprehensive Plan includes countywide elements and area plans, as well as a number of more detailed plans and studies related to the plan (Washoe County 2003a). The North Valleys Area Plan, Spanish Springs Area Plan, Spanish Springs Specific Plan, Sun Valley Area Plan, Truckee Canyon Area Plan, Warm Springs Area Plan, and Reno/Stead Corridor Joint Plan identify existing and designated land uses within the study area. The North Valleys, Spanish Springs, Sun Valley, and Truckee Canyon Area Plans state that utilities such as electrical lines should be placed underground. The Warm Springs Area Plan states that electrical lines should be placed underground to the maximum practicable extent (Washoe County 2003a).

Proposed Action

Existing Land Use: Vacant/minor improvements/ common area, low density rural, medium density rural, high density rural, low density suburban, general commercial, industrial, agricultural, and undeveloped.

Designated Land Use: High density rural, public and semipublic facilities, general commercial, low density suburban, neighborhood/office commercial/limited industrial, open space, neighborhood/office commercial/industrial, and medium density suburban.

Proposed Sugarloaf Substation

Existing Land Use: Undeveloped.

Designated Land Use: Neighborhood/office commercial/ limited industrial.

Proposed Stead Airport Substation

Stead Airport land use is addressed below.

Northern Alternative

Existing Land Use: Vacant/minor improvements/ common area, low density rural, medium density rural, high density rural, low density suburban, office commercial, industrial, agricultural, and undeveloped.

Designated Land Use: Rural residential/general rural, low density rural, and low density suburban.

Calle de la Plata Alternative

Existing Land Use: Vacant/minor improvements/ common area, low density rural, medium density rural, high density rural, low density suburban, office commercial, industrial, agricultural, and undeveloped.

Designated Land Use: Rural residential/general rural, neighborhood/office commercial/limited industrial, open space, neighborhood/office commercial/ industrial, and low density suburban.

Foothills Alternative

Existing Land Use: Vacant/minor improvements/ common area, low density rural, medium density rural, high density rural, low density suburban, medium density suburban, general commercial, office commercial, industrial, parks and recreation, agricultural, and undeveloped.

Designated Land Use: Rural residential/general rural, high density rural, public and semipublic facilities, general commercial, low density suburban, neighborhood/office commercial/limited industrial, open space, neighborhood/office commercial/ industrial, medium density suburban/suburban residential, and high density suburban/low density residential.

Southern Alternative

Existing Land Use: Vacant/minor improvements/ common area, low density rural, medium density rural, high density rural, low density suburban, medium density suburban, general commercial, industrial, parks and recreation, agricultural, and undeveloped.

Designated Land Use: Rural residential/general rural, high density rural, public and semipublic facilities, general commercial, low density suburban, neighborhood/office commercial/limited industrial, open space, medium density suburban, medium density suburban/suburban residential, and high density suburban/low density residential.

Existing Corridor Alternative

Existing Land Use: Vacant/minor improvements/ common area, low density rural, medium density rural, high density rural, low density suburban, medium density suburban, high density suburban, low density urban, general commercial, tourist commercial, industrial, public and semipublic facilities, agricultural, and undeveloped.

Designated Land Use: Low density rural, medium density rural, low density suburban, medium density suburban, high density suburban, low density urban, medium density urban, general commercial, neighborhood commercial/office, industrial, public and semi-public facilities, parks and recreation, and rural residential/general rural.

Alternative Sugarloaf Substation

Existing Land Use: General commercial.

Designated Land Use: General commercial.

Alternative Stead Airport Substation

Existing Land Use: Undeveloped.

Designated Land Use: Rural residential/general rural.

The Proposed Stead Airport Substation would be located on land owned by the Airport Authority of Washoe County.

Existing Land Uses. Undeveloped. There is currently a utility line approximately 30 feet east of portions of the western property line fence.

Designated Land Uses. The western portion of the airport property where the substation would be located is categorized as either vacant or for public use (Coffman Associates, Inc. 1994). Permitted land uses on the western portion of the airport property include power substations and other public facilities. Development guidelines for structures in this area are defined in the Stead Airport Development Standards Handbook (Airport Authority of Washoe County 2000). For example, overhead power lines carrying more than 25 kilovolts of electricity would require a special use permit issued by the City of Reno (Polak 2003). Also, a 300-foot-wide setback from the airport's western property line to the east is to remain undeveloped (Jeff Codega Planning/ Design, Inc. 2000).

City of Reno land use policies and specific planning areas are identified in the City of Reno Master Plan (City of Reno 2000). The Stead Neighborhood Plan would cover all transmission line routes. Stead is part of Reno but has its own defined boundary because mountains separate it from the balance of the city to the south (Community Development Department 2001). All alternatives would traverse land designated for urban residential/commercial, single-family residential, mixed residential, public facility, and park/open space. In addition, the Foothills and Southern Alternatives would be on land designated for industrial, public facility, and parks/ recreation/open space uses south of the Stead Airport. The Proposed Action and all alternatives would be on land designated for parks/

recreation/open space use along the western boundary of the airport. However, the Northern, Foothills, and Calle de la Plata Alternatives would cross much less of the parks/recreation/open space land use designation than the Proposed Action, Southern Alternative, and Existing Corridor Alternative (Community Development Department 2001).

The Existing Corridor Alternative would be covered by both the Stead Neighborhood Plan and the Panther Valley Neighborhood Plan. In the Panther Valley Neighborhood, the Existing Corridor Alternative would be on land designated for residential (one to three dwelling units per acre), neighborhood commercial, and park/open space (City of Reno 2000).

The City of Sparks Master Plan is based on the TMRP and is the official plan for the city and its Sphere of Influence (SOI). It sets development goals for the community and serves as a policy guide and basis for land use planning. The transmission line routes of the Proposed Action and all alternatives begin at the Tracy Power Plant within the Sparks SOI; as such, all would traverse the Sparks SOI.

The Northern Sparks SOI would cover the proposed route area. The northern boundary of the Northern Sparks SOI is the southern side of La Posada. The proposed route, Foothills Alternative, and Southern Alternative would run east-west on the southern side of La Posada. The land along the southern side of La Posada is designated for open space/rural reserve and residential (one dwelling unit per acre). The Northern Sparks SOI Plan component of the City of Sparks Master Plan identifies SPPCo's plans to expand electrical service, including recommendations for overhead and underground distribution lines, a transmission line between substations in Stead and at Tracy, and a new substation north of Spanish Springs Valley (City of Sparks 1991). The Existing Corridor Alternative would be in the North Sparks SOI and in the Urban Sparks SOI. The route would be along Pyramid Highway southwest of La Posada. The land along the western side of Pyramid Highway in this area is designated for open space/rural reserve, low density/medium density residential, general commercial, estate density residential (one to three dwelling units per acre), and residential (three dwelling units per acre) (City of Sparks 2002).

Access and Transportation

Roads in the project area consist of interstate highways, US highways, state highways, county roads, and city streets. Figure 1-1 depicts most transportation routes in and surrounding the project area. Table 3-3 lists the number of roads that would be intersected by each alternative transmission route.

GEOLOGY AND SOILS

The following section is an overview of regional and site-specific geology and soils. Valid existing rights of mining claimants are not discussed in this document. The public land within the Proposed Action area is closed to mineral entry under the general mining laws and to geothermal leasing. Salable mineral disposal is restricted to existing operations; new permanent facilities are limited to locations that are topographically screened or concealed from sight of existing or planned residential areas and major transportation corridors. Provisions for new aggregate operations on public land will be secondary to protect open space values.

Geology

Geologic History

The proposed project is in the Great Basin section of the Basin and Range Physiographic Province. The region has a complex geologic history dominated at various times by volcanism, faulting, and sediment deposition or erosion (BLM 1992a). The region is characterized by a structural geologic system of upraised fault blocks forming semi-parallel mountain ranges separated by down-dropped interrange areas, which typically have been filled to great depths by alluvium. The structures are aligned on predominantly north-south axes. The ranges are predominantly linear and are separated by valleys, many of which are closed basins (BLM 2001c).

Table 3-3
Road Crossings

Land Use Category	Number of Road Crossings[1]
Proposed Route	62
Northern Alternative	87
Calle de la Plata Alternative	59
Foothills Alternative	80
Southern Alternative	81
Existing Corridor Alternative	112

[1] Number of roads crossed by proposed transmission line centerline, including a five-foot buffer on both sides of centerline. Where the same road is crossed more than once, each crossing is included.

Source: ESRI 2003

The fault block structures of the region are the product of extensive faulting characteristic of the region between the Rocky Mountains on the east and the Sierra Nevada on the west and have been occurring for over 100 million years. The most recent episode of mountain building, referred to as the Basin and Range Orogeny, began more than 30 million years ago during the Oligocene Epoch. Most of the characteristic topography of the region has been a product of this younger orogeny (Hose and Blake 1976). The Basin and Range orogeny continues to the present, as evidenced by historic fault-based earthquakes (Stewart and McKee 1977; BLM 2001c).

In the Southern part of Washoe County the Fox Range, Lake Range, Truckee Range, Pah Rah Range, Virginia Range, and Carson Range are the dominant mountain ranges. Major valleys include Truckee Meadows and Washoe Valley (Washoe County 1991). The age of rocks can be an indication of their resistance to erosion and weathering. Except for volcanic rock, Tertiary age rock (65 million years ago), which tends to be hard and resistant to erosion, is often unconsolidated and relatively erodable compared to older rock. Most of the exposed rocks in Washoe County are Tertiary age or younger. Pre-Tertiary rocks occur in the southern portion of the county, where metamorphosed volcanic and sedimentary rocks of the late Paleozoic and middle Mesozoic are intruded by granitic rocks of the late Mesozoic age (Bonham 1969, as cited in BLM 2002c). The major geologic units that underlie the area of the Proposed Action and alternatives were determined based on geologic maps of the USGS quadrangles that contain the study area (Garside et. al 1999; Bell and Bonham 1987; Bonham and Bingler 1973; Cordy 1985; Soeller and Nielsen 1980; Garside and Nials 1998; Garside 1993; Stewart and Carlson 1978). The units and their descriptions are provided in Appendix C.

Physiography

Slope is an important indicator of constraints related to engineering requirements, erosion hazard, and potential slope instability. For purposes of mapping, slopes are classified into four groups: flat (under 1 percent slope); gently sloping (1 to 5 percent); moderately sloping (5 to 15 percent), and steeply sloping (greater than 15 percent). While the region is occupied by numerous mountain ranges with steep slopes, most of the land area is occupied by broad, long valleys characterized by gentle slopes. The broad valley floors, including playa (dry lake) surfaces, are predominantly flat slopes. The alluvial fan and pediment slopes are predominantly flat in the lower-lying areas, where they merge into the valley bottoms, and increase in slope toward the mountain front, where the slope increases abruptly. Local erosion channels in the fans may have moderately and steeply sloping channels (BLM 2001c).

Seismicity

Nevada is the third most seismically active state in the United States. Over the last 150 years, a magnitude 7 or greater earthquake has occurred somewhere in Nevada about once every 30 years. Most faults are "normal" type faults, but some Nevada faults are "strike-slip" faults like the San Andreas Fault in California (Price et al. 1999). Most of the relative motion on a normal fault is vertical, while it is mainly horizontal on a strike-slip fault. Western Nevada is classified as Seismic Risk Zone 3 by the Unified Building Code, which indicates that major damage could occur during an earthquake (Figure 3-1). The largest earthquake in the vicinity of the Proposed Action was that of April 24, 1914, which lasted ten seconds and caused light structural damage. Two other earthquakes in 1941 and 1953 also caused limited damage. Additionally, a series of mild and moderate earthquakes in January 1991 were centered in the southern part of Washoe County (Washoe County 1991). Estimates obtained from the US Geological Survey's Seismic Hazard Mapping Project indicate that a peak ground acceleration within the project area of between 30 and 40 percent of gravity has a 10 percent probability of being exceeded in 50 years (USGS 1996). The amount of ground shaking from an earthquake and consequent potential for structural damage depends on the earthquake magnitude, the distance to the fault rupture, the underlying geologic materials, the structure design, and the direction of travel of seismic waves relative to the weakest elements of the structure. Soft, loose, thick alluvial sediments and fill materials amplify seismic waves and enhance ground shaking compared to bedrock.

The secondary hazards of earthquakes include liquefaction, rapid ground settlement, and induced landslides and rock falls. Liquefaction is the rapid transformation of loose, water-saturated sandy sediments to a fluid-like state because of ground shaking during an earthquake. The rapid loss of pore pressure in the sand causes it to lose its strength (intergranular friction), with the result that the soil loses its bearing capacity. Liquefaction is likely to be a hazard only in areas with shallow groundwater and sandy soil. Alluvial materials also may become denser because of ground shaking, resulting in the rapid settlement of the soil. In the areas with steep or unstable slopes, ground shaking also may dislodge rocks or trigger landslides (BLM 2001c).

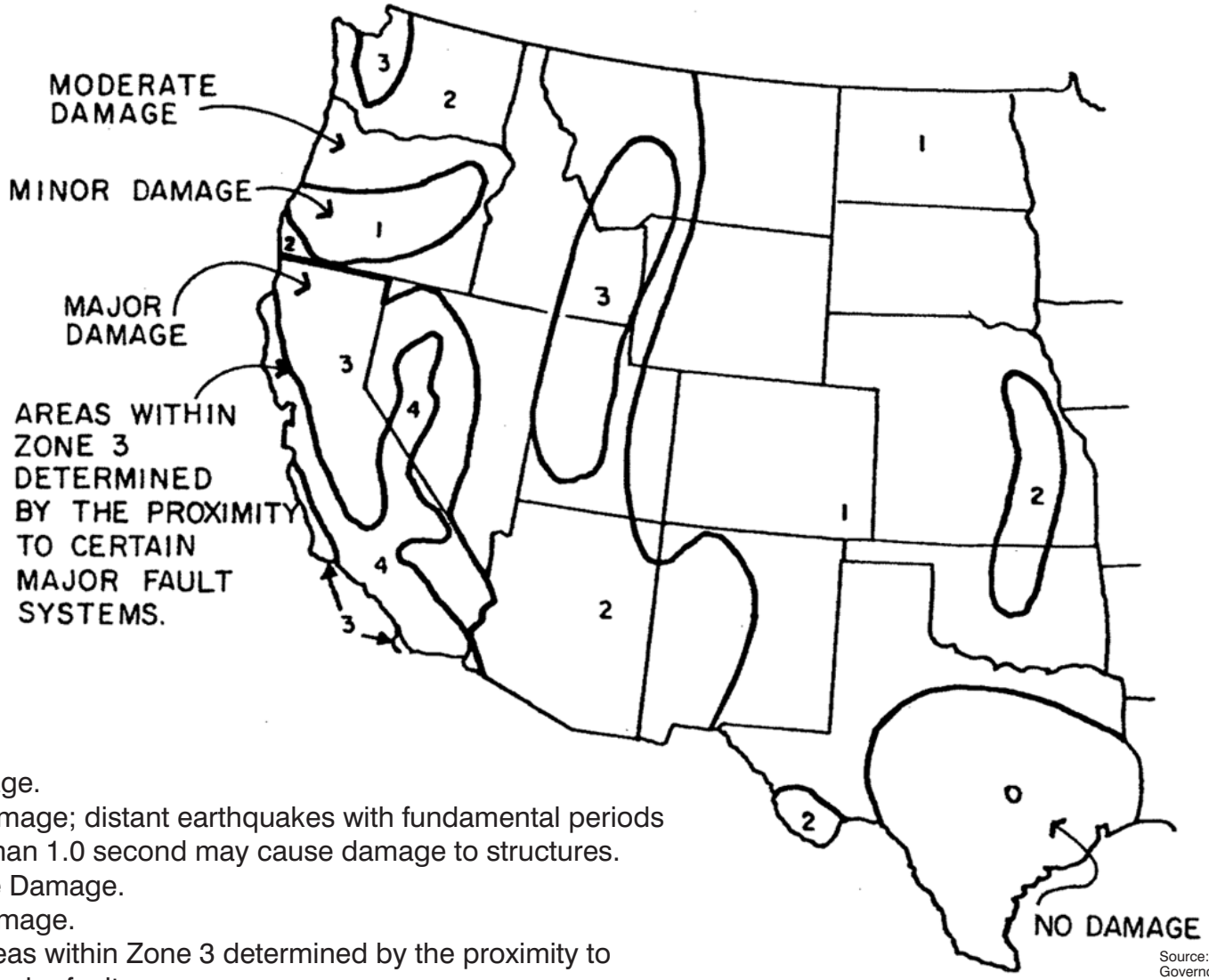
Soils

Soil is the unconsolidated mineral or organic material on the surface of the earth that serves as a natural medium for the growth of land plants (SSSA 1997). A combination of precipitation, rock type, and the presence of microbes dictate the type of soil that is formed in a particular area (Price et al. 1999). Soil is grouped into classes on the basis of parent material, chemical composition, particle size and makeup, manner of deposition, and other considerations (City of Reno 1997).

The primary source of information for soils within the project area was obtained from the US Department of Agriculture and the National Resources Conservation Service (formerly the Soil Conservation Service). The published soil survey for the Washoe County, Nevada Southern Part was applicable to the project area (Baumer 1980).

Soil survey mapping generally organizes soils into series and map units. The soil series is the lowest category of the national soil classification system and is the most homogeneous class in the system of taxonomy. Soil map units typically represent associations of two or three major soil components, as well as inclusionary soils. The project area is composed of areas dominated by soils on floodplains and low terraces, partially moist soils on alluvial fans and terraces, and partially moist soils on foothills and low hills. The major soil areas consist of the following map units (described in further detail in Appendix D):

- Mellor-Updike-Godecke;
- Haybourne-Wedertz-Mottsville;
- Reno-Galeppi-Chalco;
- Oest-Orr-Leviathan;



Zone 0 - No Damage.
Zone 1 - Minor Damage; distant earthquakes with fundamental periods greater than 1.0 second may cause damage to structures.
Zone 2 - Moderate Damage.
Zone 3 - Major Damage.
Zone 4 - Those areas within Zone 3 determined by the proximity to contain major fault zones.

Source:
Governor's Office of Planning Coordination, Ad Hoc Panel on Seismic Hazard Mitigation as cited in Washoe County 1991.

Western Nevada is classified as Seismic Risk Zone 3 by the Unified Building Code, which indicates that major damage could occur during an earthquake.

Seismic Risk Zone Map of the Western United States

Washoe County Comprehensive Plan

- Acrelane- Graufels-Glenbrook;
- Indiano-Flex-Koontz; and
- Xman-Duco-Old Camp.

WATER RESOURCES

The following section is an overview of regional and site-specific hydrologic conditions within the project area, which includes watersheds downstream and the groundwater aquifers below and downgradient of the proposed transmission line routes, staging areas, and substation sites.

Surface Water

The proposed project spans two major hydrologic regions in Nevada: the Truckee River Basin and the Western Region; the former includes Hungry Valley, Warm Springs Valley, Spanish Springs Valley, and Antelope Valley, and the latter encompasses 2,300 square miles and drains northward toward Pyramid Lake. The Western Region covers 602 square miles, contains nine hydrographic subareas, and extends west into California (NDWR, no date). The minor hydrographic subbasins that span the project area are shown in Figure 3-2.

The Truckee River is the only perennial stream within the project area. The Truckee River originates at the northern end of Lake Tahoe in California and flows northeast through Truckee Meadows in Nevada. The 145-mile-long river terminates at Pyramid Lake (DCNR 2002).

Flooding

Nevada is subject to two types of flooding; rivers overtopping their banks and alluvial fan or flash flooding. The most severe flooding on the Truckee River occurs when warm winter rain falls on snow in the higher mountain ranges. Flash flooding is common on alluvial fans of smaller drainages (DCNR 2002). Figure 3-3 displays 100-year floodplains within the project area.

The damaging effects of floods in urban communities have increased steadily with population and development since the mid 1900s. Land development has encroached onto riverine and alluvial fan floodplains, decreasing floodwater storage capacity and increasing flood damage risk. The local governments within Clark and Washoe Counties have developed regional flood control plans and programs and are working on controls to additional runoff generated by new development. For example, an interest is growing in restoring natural floodplain features and functions, as seen in the Truckee River Flood Management Plan (DCNR 2002).

Groundwater

Water reaches the project area groundwater system mainly by seepage from streams on alluvial aprons and by percolation through consolidated rocks. Most precipitation and snowmelt evaporate before infiltrating the soil, and only a small amount recharges the groundwater reservoir.

The Proposed Action is located within the boundaries of the Truckee Meadows Regional Plan. According to the State Engineer, all of the groundwater basins in the vicinity of the Truckee Meadows have been designated as being depleted or in need of additional administration. Basins include one or more aquifers, or water-filled cracks, joints, and pores in consolidated volcanic, granitic, or sedimentary rock formations or thick, unconsolidated valley sediment deposits formed by upland erosion. The proposed route of the transmission line crosses the Tracy Segment, Spanish Springs Valley, and Lemmon Valley hydrographic basins. In its *Interim Water Policies and Criteria,* dated February 25, 2003, the Regional Water Planning Commission has identified the following conclusions regarding each hydrographic basin:

Tracy Segment: Surplus groundwater may be available for future development, although the availability may be constrained due to the quality of the groundwater, which has nitrate, iron, arsenic, manganese and sulfate, all of which occur naturally in the area.

Spanish Springs Valley: There is a groundwater deficit when comparing perennial yield and existing commitments. There will need to be additional water resources, either through use of Truckee River water or importation from some other source, to support future development in the hydrobasin. Water quality issues relate to nitrate contamination from septic systems and naturally occurring arsenic in some domestic wells.

Lemmon Valley: There is a groundwater deficit when comparing perennial yield and existing commitments. Water will need to be imported into the hydrobasin to support future development.

According to the Regional Water Management Plan (RWMP), the amount of groundwater currently pumped is nearing the estimated perennial yield (Washoe County 1997). Perennial yield is the estimated volume (acre feet) of usable water in a groundwater basin or aquifer that can be economically withdrawn and consumed each year for an indefinite period without depleting (mining) the source. In some basins, withdrawals exceed perennial yields. Groundwater resources for quasi-municipal supply are of good or very good quality, but quality may deteriorate in the future as pumping increases. If over-pumped, groundwater levels may be irreparably lowered (TMRPA 2002b, DCNR 2002).

VEGETATION AND WETLANDS

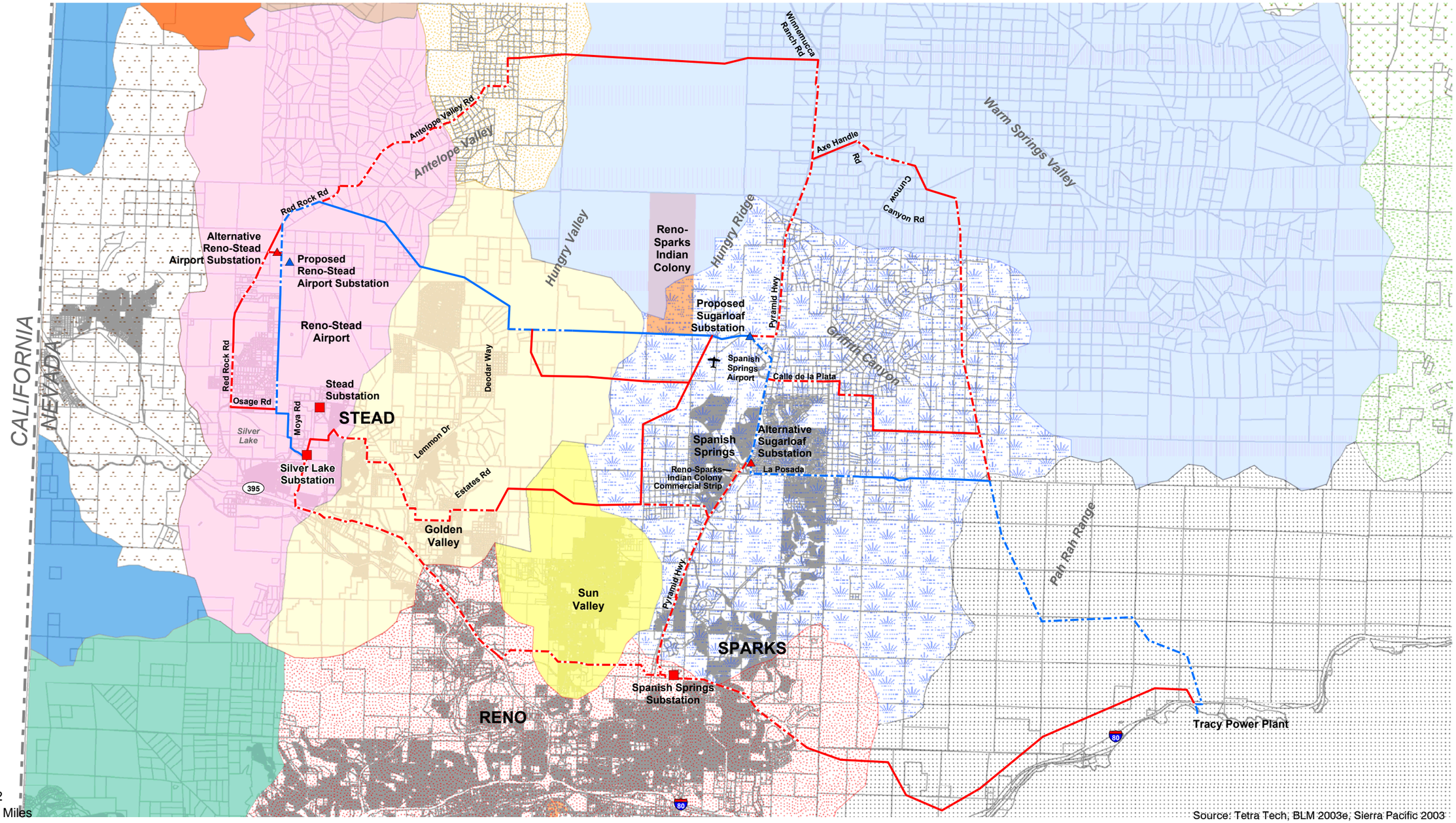
This section is a general overview of the regulatory setting and region's vegetation resources and a description of the plant communities, including wetlands and waters of the United States, as defined by the US Army Corps of Engineers (ACOE), within the study area.

Regional Setting

The Proposed Action is just inside the western portion of the Great Basin, within the rain shadow of the Sierra Nevada Mountain Range. The topography of the area ranges from relatively low elevation valley floors to low elevation mountain ranges. The predominant mountain range is the Pah Rah Range, north of the Tracy Power Plant and east of Spanish Springs Valley. The lowest valley floor belongs to that of the Truckee River at the Tracy Power Plant. The elevation range of the Proposed Action and all alternatives varies from the Truckee River at 4,265 feet (above mean sea level) to just over 6,000 feet across the Pah Rah Range. Spanish Springs Valley and Lemmon Valley are both around 5,000 feet in elevation.

The Great Basin is characterized by Basin and Range topography, with rivers terminating in valleys because there is no outflow to the ocean. Precipitation usually occurs during the winter, generally as snow. The project area receives anywhere from 4 to 13 inches per year, depending on elevation (DRI 2001). The lowest portions of valleys usually support salt-tolerant species, given that the water that ends up at these low areas leaves only by way of percolation and evaporation, resulting in significant salt and mineral accumulation. The edges of the valleys generally have deep alluvial deposits from the slow but constant erosion of the mountain ranges. The mountain ranges often have shallow lithic soils but support a greater diversity of plants due to the increased precipitation there.

Plant communities in the western region of the United States have evolved with fire, which plays a significant role in plant succession. Since the West was settled, the frequency of fire has increased, causing a significant shift in the ecosystems of the region. Grazing, fire suppression (by increasing the fuel loads), invasive plant species, and human-caused fires have all been blamed for this shift. The lands surrounding the Reno-Sparks area are a good example of this change in landscape. Many significant wildfires have occurred throughout the area, and, as such, plant communities have not recovered from these frequent or intense fires. The result is the conversion of native plant communities to invasive fire-prone communities, which contain combustible annual plants, such as cheatgrass *(Bromus tectorum)* (BLM 1999b).



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The proposed project spans two major hydrologic regions in Nevada: the Truckee River Basin (made up of four sub-basins) and the Western Region (made up of nine sub-basins).

Legend

Routes
- Proposed Route
- Proposed Route (incorporating existing line)
- Alternative Route
- Alternative Route (incorporating existing line)

Substations
- Existing Substation
- Proposed Substation
- Alternative Substation

Hydrobasins
- Antelope Valley
- Bedell Flat
- Long Valley
- Cold Springs Valley
- Lemmon Valley (east)
- Lemmon Valley (west)
- Pyramid Lake Valley
- Red Rock Valley
- Spanish Springs Valley
- Sun Valley
- Tracy Segment
- Truckee Canyon Segment
- Truckee Meadows
- Warm Springs Valley
- Dodge Flat

Tetra Tech, Inc

Hydrographic Basins

Tracy to Silver Lake 120 kV Transmission Line

Washoe County, Nevada

Figure 3-2

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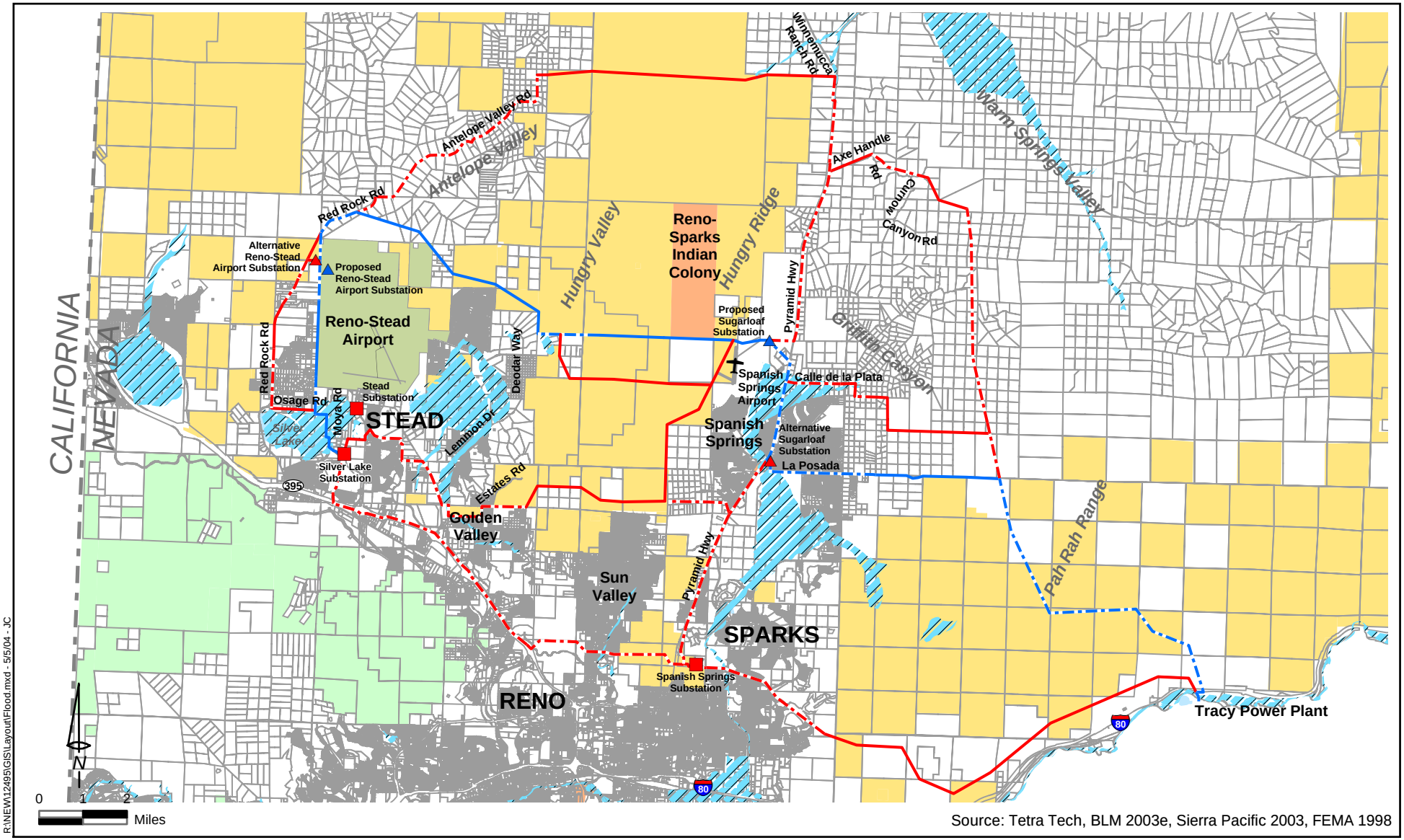

Source: Tetra Tech, BLM 2003e, Sierra Pacific 2003, FEMA 1998

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A 100-year flood plain is a stretch of land that is inundated approximately once every hundred years.

Legend

Routes
- Proposed Route
- Proposed Route (incorporating existing line)
- Alternative Route
- Alternative Route (incorporating existing line)

Substations
- Existing Substation
- Proposed Substation
- Alternative Substation

Special Flood Hazard Area
- 100 yr. Flood Plain
- Perennial Stream

Land Status
- Bureau of Land Management
- Native American Reservation
- Private
- County/City Parks
- US Forest Service
- Water
- Airport Authority of Washoe County

Special Flood Hazard Area

Tracy to Silver Lake
120 kV Transmission Line

Washoe County, Nevada

Figure 3-3

Tetra Tech, Inc

Vegetation

Field surveys were conducted in July 2002, January and July 2003, and March 2004 to map plant communities and to verify ecological conditions. Eight general plant communities were identified within the study area. Conditions of the communities range from moderately to significantly disturbed. Because the Proposed Action and the Calle de la Plata Alternative both border urban areas, most of the disturbance to the landscape is human caused, such as off-highway vehicle (OHV) use and firearm target practice. Other notable impacts are random dumping, utility infrastructure, urban sprawl, and wildland fires. Some weedy species, such as cheatgrass, were found within all but a few communities. Mapped plant communities are presented on Figure 3-4.

Sagebrush

Three species of sagebrush were noted in the survey area: the common Wyoming sagebrush *(Artemisia tridentata* ssp. *wyomingensis),* less common mountain or Vasey's sagebrush *(A. t.* ssp. *vaseyana),* and, in very restricted areas within the thin rocky soils on the ridges of the Pah Rah Range, low sagebrush *(A. arbuscula).* These sagebrush-dominated communities generally have a diversity of forbs and grasses, along with a smattering of other species of shrubs. Young or scattered juniper trees may be found mixed with the sagebrush community. Junipers that dominate or create an overstory are considered juniper woodland and were mapped as such. Shrub species included rubber rabbitbrush *(Chrysothamnus nauseosis),* green ephedra or Mormon tea *(Ephedra viridis),* desert peach *(Prunus andersonii),* antelope bitterbrush *(Purshia tridentata),* desert gooseberry *(Ribes velutinum),* and spineless horsebrush *(Tetradymia canescens).* Subshrub species include a variety of buckwheat *(Eriogonum baileyi, E. cespitosum, E. nidularium).* Depending on elevation, the forbs include false dandelion *(Agoseris* spp.*),* milkvetch species *(Agstragalus* spp.*),* and Hooker's and arrowleaf balsamroot *(Balsamhorhiza hookeri* and *B. sagittata).* Grass species included Great Basin wild rye *(Elymus cinereus),* squirreltail grass *(E. elymoides),* perennial rye *(Lolium perenne),* Sandburg bluegrass *(Poa secunda),* and, in sandier soils, Indian ricegrass *(Oryzopsis hymenoides),* sand dropseed *(Sporobolis cryptandrus),* and needle and thread grass *(Hesperostipa comata).*

Salt Desert Shrub

This community is restricted to valley floors where low precipitation and more saline soils exist. The principal shrub species here is shadscale *(Atriplex confertifolia).* Other shrub species that make up the salt desert shrub community are four-winged saltbush *(A. canescens),* green rabbitbrush *(Chrysothamnus viscidiflorus),* green ephedra, spiny hopsage *(Grayia spinosa),* snakeweed *(Gutierrezia sarothrae),* and, very sporadically, winterfat *(Krascheninnikovia lanata).*

Greasewood

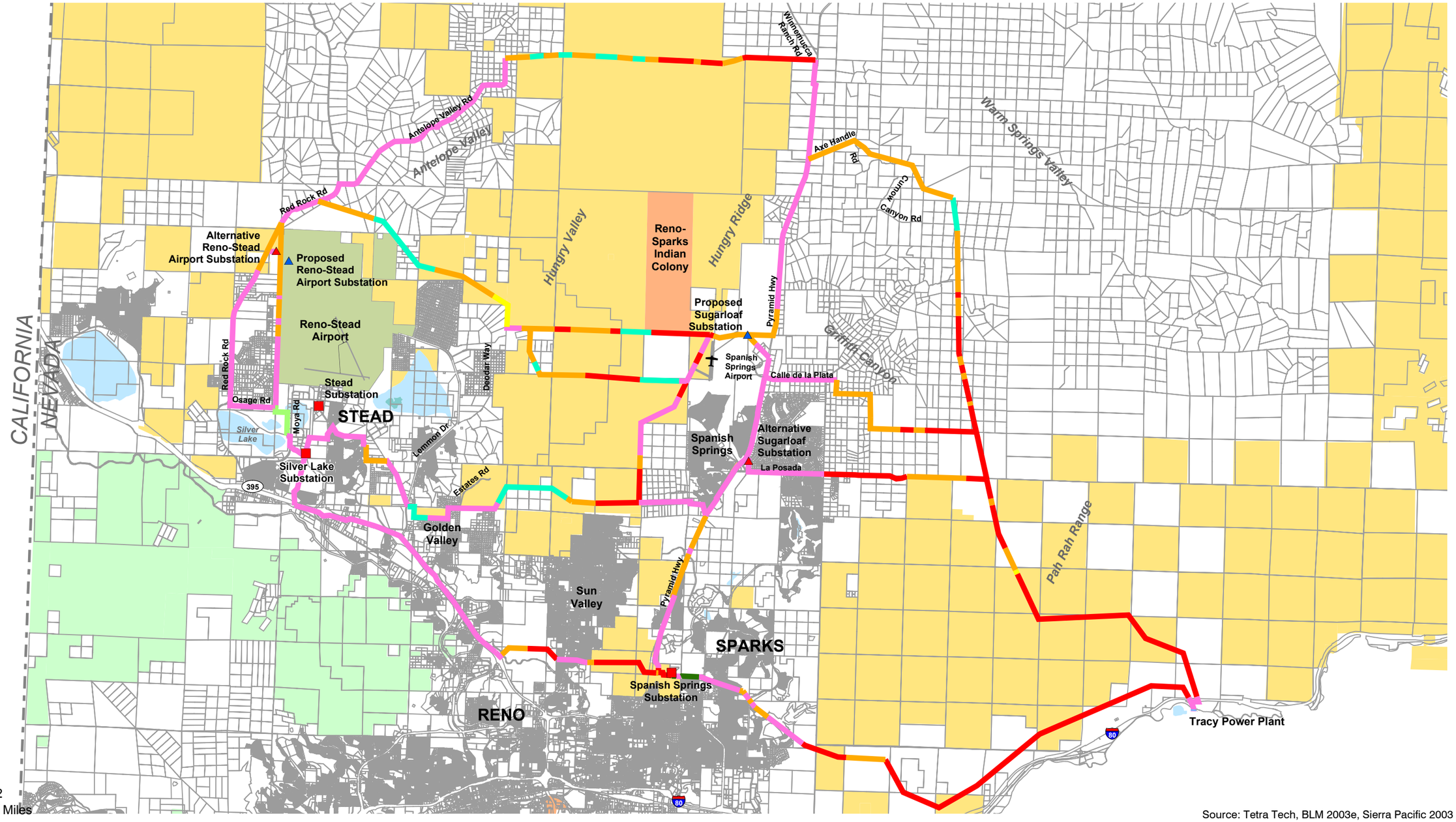
This community is dominated almost exclusively by greasewood *(Sarcobatus vermiculatus),* which is adapted to saline soils but is more indicative of a shallow water table, as it obtains water from a permanent water table. Breaking up the monotypic stand of greasewood are saltgrass *(Distichlis spicata* var. *spicata)* and shadscale and weedy species, such as halogeton *(Halogeton glomeratus)* and Russian thistle *(Salsola tragus).*

Juniper Woodland

This community is almost entirely Utah juniper *(Juniperus osteosperma)* but has a few scattered western juniper *(J. occidentalis)* and, rarely, pinyon pine *(Pinus monophylla),* mostly in the Pah Rah Range. Juniper woodlands in this area generally occupy mountains and foothills above 5,300 feet where those areas receive at least 12 inches of moisture per year. Shrubs that occupy the understory of the juniper woodland include ephedra, antelope bitterbrush, desert gooseberry, sagebrush, and horsebrush. Forbs and grasses include arrowleaf balsamroot, milkvetch species, buckwheat species, lupine species, sand dropseed, and needle and thread grass.

Ruderal/Developed

This community includes areas of urbanization and sprawl, ranchettes, industrial complexes, roads,



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Source: Tetra Tech, BLM 2003e, Sierra Pacific 2003

Eight general plant communities span the Proposed Action and Alternative study area.

Legend

Vegetation

- Developed/Ruderal
- Fire Affected Community
- Sagebrush Community
- Juniper Woodland Community
- Salt Desert Shrub Community
- Riparian
- Greasewood
- Agricultural

Land Ownership

- Bureau of Land Management
- Native American Reservation
- Private
- County/City Parks
- US Forest Service
- Water
- Airport Authority of Washoe County

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Mapped Plant Communities

Tracy to Silver Lake 120 kV Transmission Line

Washoe County, Nevada

Figure 3-4

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gravel pits, or other areas of human-caused impacts. Where vegetation occurs on these sites it is generally ruderal (weedy), for example, cheatgrass, tumble mustard *(Sisymbrium altissimum* or other weedy species), or landscape plantings.

Fire-Affected

This community incorporates communities that have burned within the last 20 years. Generally these fires have affected sagebrush and juniper woodland habitats. Cheatgrass, tumble mustard, Russian thistle, red-stemmed filaree *(Erodium cicutarium),* and other weedy annuals commonly occupy fire-affected communities. In the fire-affected communities that burned in the mid-1990s or earlier, colonizing species, such as rubber rabbitbrush and snakeweed, occupy the shrub component.

The most recent fires near alternative routes were in 1999 and 2000 in the Hungry Valley, Red Rock, Pah Rah, and Hungry Ridge areas. The project area within the Pah Rah Range has burned numerous times, with little successful recovery. Restoration efforts were either not employed or have not been entirely successful. Some areas, such as the northern portions of Hungry Ridge and Hungry Mountain, burned in the mid-1980s and have made some recovery but were never reseeded (Bringham 2002). The more recent burns have not been successful with reclamation but were reseeded. The area south of the Dry Lakes in the Pah Rah Range has burned numerous times, most recently in 1996 and 2000 (BLM 2002d.) This area is dominated by annual sunflower *(Helianthus annus).*

Riparian

This community contains willow species, such as coyote willow *(Salix exigua)* and Fremont cottonwood *(Populus fremontii).* The Truckee River area is mapped as riparian, although this portion of the river does not support a healthy riparian system. Coyote willow was noted near the Orr ditch in the southern Spanish Springs Valley, but this area was predominately agricultural. Riparian communities and habitats are discussed in more detail below.

Agricultural

This community includes irrigated grass pastures in Spanish Springs Valley.

Wetlands and Riparian

Jurisdictional wetlands were not located within the study area, except for the Truckee River near Tracy. A jurisdictional wetland contains hydrophytic vegetation and hydric soils. This portion of the river has been significantly affected by flooding, dredging, construction of cooling ponds, and other human-caused disturbances. Very little healthy riparian habitat exists in this location because most of the vegetation is a very aggressive noxious weed, tall whitetop *(Lepidium latifolium;* please refer to the Nonnative Invasive Species section for further discussion), although there are a few cottonwoods in poor health scattered in this area. Wetland delineations using the ACOE Wetland Delineation Manual (ACOE 1987) were not performed as part of the EIS.

A review of available National Wetland Inventory (NWI) maps, combined with field surveys conducted in July 2002, July 2003, and March 2004, determined that other waters are drainages (ephemeral, intermittent, or perennial) that convey water or connect to a navigable waterway, as defined by the ACOE. Drainages that fall within this definition were not identified within the study area, except for the Dry Lakes area of the Pah Rah Range, which drains to the Truckee River and potentially the Orr Ditch. Ephemeral drainages, those that convey water during spring runoff or when it rains, are the most common drainage within the project area. These drain to isolated valleys, such as Spanish Springs, Lemmon Valley, or Hungry Valley. Named creeks, perennial creeks or those that would be considered intermittent drainages that might continuously flow during the wet season are not located within the project area. The Orr Ditch and associated smaller irrigation ditches are crossed in southern Spanish Springs Valley. This irrigation ditch, through which Truckee River water is imported to agricultural lands and potentially to Wingfield Springs Golf Course, has a return flow to the Truckee River via the North

Truckee Drain. Some of the pasture areas surrounding the Orr Ditch support emergent species, such as cattails *(Typha latifolia),* sedge, and rush species. Hardstem bulrush *(Scirpus acutus)* was noted within the ditch.

High quality riparian habitat can generally support more species than most other habitat types due to the presence of water and a productive nutrient-rich environment. Historic losses to riparian habitats have been significant over the years, and, as such, many species that depend on them, such as migratory songbirds or fish, are becoming rare. The Truckee River at Tracy has marginal riparian habitat. Few other intermittent drainages support woody riparian habitat, such as willow species, except near the Orr Ditch in the southern end of Spanish Springs Valley. The area surrounding Silver Lake contains greasewood, saltgrass, and some emergent *Carex* and *Juncus* species. These are within the study corridor, where water has ponded at the edges of the roadways, but are not connected to Silver Lake itself. With the exception of the Truckee River and the Orr Ditch, little potential for riparian habitat exists along all of the alternatives.

INVASIVE NONNATIVE SPECIES

For the purpose of this EIS, invasive nonnative species are noxious introduced weeds that are mandated to be prevented or controlled because of their potential to cause economic harm (e.g., affect the quality of forage on rangelands or affect cropland or forest land productivity) or environmental harm (e.g., displace native plants and natural habitats) or to harm humans. State, federal, or other laws and regulations legally mandate preventing or controlling these species. Noxious weeds are typically those that can still be effectively controlled and are generally not weeds that have become too widely distributed to be effectively controlled. Noxious weeds are species in the following categories:

- Plant species considered noxious weeds by the US Department of Agriculture;
- Plant species listed as noxious weeds by the State of Nevada Department of Food and Agriculture (NRS 555); and
- Plant species listed as invasive or noxious weeds of concern by BLM.

Invasive exotic plants are degrading ecosystems throughout the West and are invading habitats at an alarming rate. Some estimates indicate the rate of spread is 14 percent a year. Within the past fifty years many of the West's ecosystems have been converted from wildlife habitat and livestock forage to millions of acres of invasive weeds. All habitats are vulnerable to infestations; weeds may spread more rapidly in disturbed areas but also invade undisturbed habitats. In Nevada, it is estimated that between 20 and 26 million acres of the total 70 million acres of rangeland is susceptible to weed establishment and spread. This estimate is based on precipitation zones from 8 to 12 inches per year (BLM 2002g). Invasive weeds are spread though a variety of means, including, but not limited to, vehicles, humans, horses, livestock, wind, water, and wildlife. Preventing the spread of noxious weeds is the best line of defense against weed invaders. Once a population of weeds is located, effective control depends on early detection, management, and eradication.

Five noxious weed species are either within the project area or in the surrounding area (Table 3-4). Three species of thistle—musk *(Carduus nutans),* Scotch *(Onopordum acanthium),* and yellowstar *(Centaurea solstitialis)*—are known to infest this portion of Washoe County. There is a known yellowstar thistle infestation on private ranch land off Winnemucca Ranch Road, north of the northern alternative (de Laureal 2002). West of Bedell Flat there is a Scotch thistle infestation and the Red Rock area heading to Peterson Mountain (de Laureal 2002). The project area for the Tuscarora Gas Transmission Hungry Valley Lateral (BLM 2000a) is infested with musk thistle. Medusahead *(Taeniatherum caput-medusae),* a very aggressive annual grass, is

Table 3-4
Invasive Plant Species Known to Occur in the Project Area

Common Name/ Scientific Name	Noxious/ Invasive	Life Cycle/ Flowering Period	Habitat	Dispersal
Medusahead *Taeniatherum caput-medusae*	N/SC	Annual grass May to June	Semiarid rangeland	Seeds
Purple loostrife *Lythrum salicaria, L. virgatum,* and cultivars	N	Perennial herb June to September	Perennial and seasonal wetlands, including marshes, ponds, stream banks, canals, and ditches	Seeds and stem fragments
Tall whitetop/perennial pepperweed *Lepidium latifolium*	N/SC	Perennial herb June to August	Waste sites, wet areas, ditches, roadsides, cropland	Seeds, spreading roots
Thistle, musk *Carduus nutans*	N/SC	Biennial or annual herb June to August	Roadsides, wetter rangeland, cultivated pastures, forests, grain fields, ditchbanks, waste sites, stream banks	Seeds, root fragments
Thistle, Scotch *Onopordum acanthium*	N/SC	Biennial to short-lived perennial Mid-June to September	Roadsides, fencerows, ditchbanks, waste areas, and pastures	Seeds
Thistle, yellowstar *Centaurea solstitialis*	N/SC	Annual herb May to October	Cultivated fields, pastures, grasslands, rangelands, waste sites	Seeds

Notes:
Noxious/Invasive is defined by the State of Nevada as any species of plant that is or is likely to be detrimental or destructive and difficult to control or eradicate (NRS 555.005).
SC = Designated by the Nevada Cooperative Extension as invasive weed species that can cause the greatest impact on Nevada's ecosystem and economic well-being.

reported to have infested areas north of Reno. None of these species were noted during the baseline surveys in July 2002 and January 2003. The irrigated pasture and Orr Ditch in Spanish Springs Valley both have the potential to contain noxious weeds, such as purple loosestrife *(Lythrum salicaria)* and any number of thistle species.

The Truckee River riparian habitat has had significant impacts from the expansion and virtual domination of an aggressive weed species called tall whitetop *(Lepidium latifolium)*. Also called perennial pepperweed, this species has extended to cover approximately 20,000 acres of riparian habitat along the Truckee River (Donaldson and Johnson 2000). The areas surrounding Tracy are no exception; where moist soils exist, tall whitetop dominates.

Because a large amount of the lands surrounding the Reno-Sparks area have burned over the past two decades and have constant effects from OHVs or other human impacts, weed infestations should be common. Many weed infestations appear to be soil related and this is exemplified within the project area. Areas that have very sandy soils support less invasive species than those soils that have higher loam contents. Soils that have formed from grandiorite frequently have less noxious weed infestations than soils formed from basalt and andesite. An example of low infestation potential despite significant human impacts is in the Lemmon Valley area, where sandy soils are prevalent. In this area, only the common ruderal species (e.g., tall whitetop) was noted growing under the shade of juniper trees. Areas likely to be heavily infested with noxious weeds are paddocks, pastures, or any enclosure with domestic animals; however, these areas were not surveyed during the baseline surveys.

WILDLIFE RESOURCES

Habitat

This section describes the general wildlife, fishery, and migratory birds that may occur in the project ROI. Wildlife in the area is that generally found in the overall Great Basin ecosystem, with primary habitat provided by vegetative communities dominated by low to medium growing plants. Field surveys were conducted in July 2002, January and July 2003, and March 2004. As described in the Vegetation and Wetlands section, there are eight general plant communities providing wildlife habitat within the study area: sagebrush, salt desert shrub, greasewood, juniper woodland, agricultural, riparian (Truckee River), ruderal/developed, and fire affected. These habitat types are the result of natural processes, such as soil composition, availability of moisture, and fire, as well as of human influences, such as fragmentation from roads and development. This habitat mosaic provides cover and forage for large and small mammals, as well as passerine (perching birds and songbirds) and migratory bird species.

Annual precipitation in the project area is approximately 8 inches, leading to an extremely dry landscape, with relatively low vegetative diversity and few water resources. Topographic variation is fairly minimal throughout much of the study area, with much of the ROW running through valleys and across low mountain ranges. These factors, along with urban encroachment and altered plant communities, lead to a relative lack of diversity of wildlife, with most species present being generalist species. such as mule deer, coyotes, jackrabbits, and various rodent species that are adapted to survive in a variety of habitat types and that have a broad range.

Mammals

Larger mammals found in the area include mule deer, pronghorn antelopes, bobcats, badgers, and coyotes. Various rodents, including Belding's and antelope ground squirrels, kangaroo rats, woodrats, and various species of mice, occupy the area as well (Appendix E).

Mule deer winter in the project area. Winter forage habitat is considered a limiting factor for mule deer populations in much of Nevada. Approximately 9,956 acres of mule deer winter range occurs along Hungry Ridge and includes a portion of the Reno-Sparks Indian Colony (Figure 3-5).

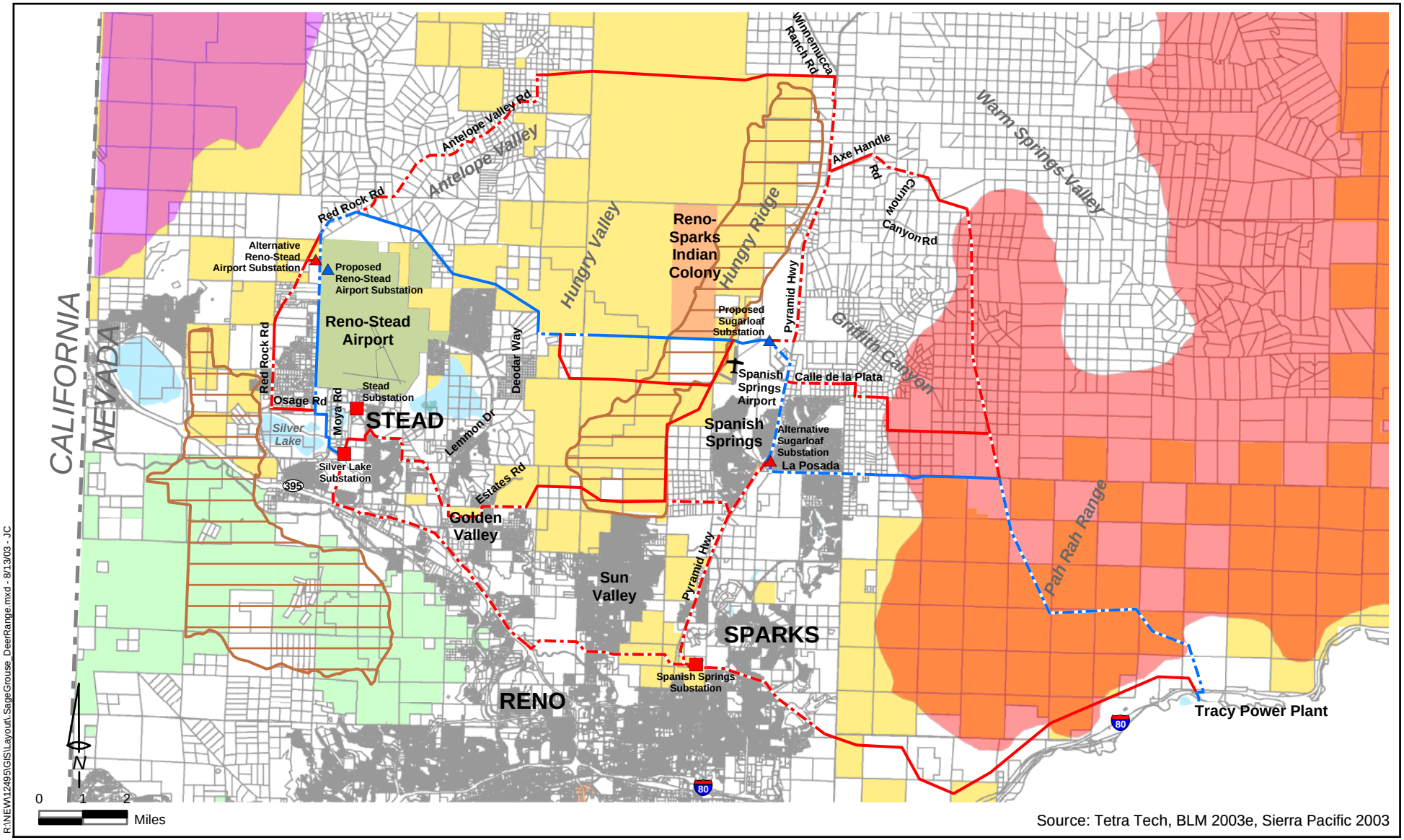
Potential bat roosting habitat is present in the rock outcropping on Hungry Ridge and in the Pah Rah Range, but there is very little nearby foraging areas and surface water near these outcroppings. As a result, it is not likely that many bat species are present along the alternative routes being considered. NDOW staff confirmed this assessment (Jeffers 2003).

Birds

Raptor species, including golden eagle and red-tailed hawks, have been observed during field visits. One and possibly two golden eagle nests were observed in the northern part of the Hungry Ridge area, in the rock outcrops above Hungry Spring. An immature golden eagle was observed soaring in this area. Field investigators in the summer of 2003 observed three old eagle nests in Griffith Canyon (Tetra Tech 2003). The nests appeared not to have been used for several years. New housing developments are relatively close and may be the reason why eagles are no longer nesting in the canyon. In addition a golden eagle was observed soaring along the Existing Corridor Alternative Route in the Pah Rah range.

Four short-eared owls were observed in Griffith Canyon. Burrowing owls have not been observed but may occur in Hungry Valley, although Tetra Tech Staff observed no suitable habitat during field surveys conducted in July 2003 and March 2004.

Sage grouse habitat and populations are discussed in the Special Status Species Section. Other species commonly occurring in the Spanish Springs area include chukar, quail, and horned lark.



Source: Tetra Tech, BLM 2003e, Sierra Pacific 2003

Approximately 9,956 acres of mule deer winter range occurs along Hungry Ridge. The Pah Rah sage grouse range encompasses a large area, with its western edge overlapping portions of all alternative routes.

Legend

Routes
- Proposed Route
- Proposed Route (incorporating existing line)
- Alternative Route
- Alternative Route (incorporating existing line)

Substations
- Existing Substation
- Proposed Substation
- Alternative Substation

Areas of Interest
- Deer Winter Range
- Sage Grouse Pah Rah Range
- Sage Grouse Virginia Range

Land Status
- Bureau of Land Management
- Native American Reservation
- Private
- County/City Parks
- US Forest Service
- Water
- Airport Authority of Washoe County

Sage Grouse and Deer Winter Range

Tracy to Silver Lake
120 kV Transmission Line

Figure 3-5

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Migratory Birds

A number of migratory bird species are likely to occur within the study area, which is within the Pacific Flyway for migratory birds, with a number of species nesting in the Pyramid lake area to the north. The USFWS developed a birds of conservation concern (BCC) list in 2002, based primarily on migratory bird species. The study area is within the BCC Region 9 (Great Basin) and identifies 29 species of concern, as shown in the Table 3-5.

Reptiles and Amphibians

Several species of snakes could be found in the project area, including the Great Basin gopher snake, Mojave patch-nosed snake, Great Basin rattlesnake, red racer, and western long-nosed snake. Potential lizard species include long-nosed leopard lizard, zebra-tailed, northern side-blotched, northern sagebrush lizard, and Great Basin whiptail (BLM 2001b).

Table 3-5
Bird Species of Conservation Concern
Potentially Occurring in the Project Area

Common Name	Scientific Name
Swainson's hawk	*Buteo swainsoni*
Ferruginous Hawk	*B. regalis*
Golden eagle	*Aquila chrysaetos*
Peregrine falcon	*Falco peregrinus*
Prairie falcon	*F. mexicanus*
Greater sage grouse	*Centrocercus urophasianus*
Yellow rail	*Coturnicops noveboracensis*
American golden-plover	*Pluvialis dominicus*
Snowy plover	*Charadrius alexandrinus*
American avocet	*Recurvirostra americana*
Solitary sandpiper	*Tringa solitaria*
Whimbrel	*Numenius phaeopus*
Long-billed curlew	*N. americanus*
Marbled godwit	*Limosa fedoa*
Sanderling	*Calidris alba*
Wilson's phalarope	*Phalaropus tricolor*
Yellow-billed cuckoo	*Coccyzus americanus*
Flammulated owl	*Otus flammeolus*
Burrowing owl	*Athene cunicularia*
Black swift	*Cypseloides niger*
Lewis's woodpecker	*Melanerpes lewis*
Williamson's sapsucker	*Sphyrapicus thyroideus*
White-headed woodpecker	*Picoides albolarvatus*
Loggerhead shrike	*Lanius ludovicianus*
Gray vireo	*Vireo vicinior*
Virginia's warbler	*Vermivora virginiae*
Brewer's sparrow	*Spizella breweri*
Sage sparrow	*Amphispiza belli*
Tricolored blackbird	*Agelaius tricolor*

Source: USFWS 2002

SPECIAL STATUS SPECIES

Special status species are those identified by federal, state, or local agencies as needing additional management consideration or protection. Federal species include those protected under the Endangered Species Act of 1973 (ESA) (16 USC §§ 1531-1544) and those that are candidates or proposed for listing under the ESA. Three federally listed endangered or threatened species and one federal candidate species were identified as potentially occurring in the project area. Based on habitat requirements for each of these federally protected species, only the Carson wandering skipper and Weber's ivesia were determined likely to occur along the routes being considered.

NDOW has identified portions of the Proposed Action area as being within range for the Pah Rah mountains population of the sage grouse, a federal species of concern. The Pah Rah sage grouse range encompasses a large area, with its western edge overlapping portions of all alternative routes (Figure 3-5). The Pah Rah range sage grouse population is very limited, although specific data identifying sage grouse occurrence and lek locations is not available. Field investigators observed that most of the specie's habitat along the alternative routes within the identified sage grouse range has been severely burned, with very limited sage and forbs. The suitability of habitat to support sage grouse was rated poor to nonexistent throughout most of the area. As a result, it is not likely that sage grouse would occur in the vicinity of the alternative project routes, under current habitat conditions.

State sensitive species include those considered sensitive by the Nevada Natural Heritage Program (NNHP). Also considered in this section are federal species of concern, which are identified by USFWS as needing management consideration but that are not afforded protection under federal laws such as the ESA. Species lists and correspondence with USFWS are included in Appendix E. The BLM maintains a list of species status species that it considers when making management decisions and assessing environmental impacts. Sensitive species considered in this document and their potential for occurrence in the project area are presented in Table 3-6.

RANGE RESOURCES

The following section addresses range resources, which include livestock grazing. BLM manages grazing under the authority of the Taylor Grazing Act of 1934, FLPMA, and the Public Rangelands Improvement Act of 1978. Under this management, ranchers may obtain permits for an allotment of public land on which a specified number of livestock may graze. The number of permitted livestock on a particular allotment is determined by how many animal unit months (AUMs) that land will support.

Livestock Grazing

The five grazing allotments within the project area, ranging from 450 acres to 71,514 acres of public land and totaling 7,405 AUMs of grazing preference, are the Spanish Springs/Mustang Allotment, Wedekind Allotment, Red Rock Allotment, Plumas Station Allotment, and Paiute Allotment (Figure 3-6). Although the Olinghouse Allotment lies adjacent to the project transmission line route, the route does not actually pass through public land within the grazing allotments. For this reason, the Olinghouse Grazing Allotment is not discussed further in the impact analysis.

Spanish Springs/Mustang

The Spanish Springs/Mustang Grazing Allotment is made up of 20,231 acres of public land and is permitted for a 210 cattle (some of which are on the allotment yearlong) between two permitees; it is composed of 1,786 AUMs (Suminski 2002).

Table 3-6
Sensitive Species that Potentially Occur Within the Project Area

Species	Status	Habitat	Likelihood of Occurrence in Study Area (route)[1]
Reptile			
Northwestern pond turtle *Clemmys marmorata marmorata*	FSC	Generally found in quiet, fresh to brackish water near wetland edges.	U
Mammals			
Big brown bat *Eptesicus fuscus*	N	Roosts in hollow trees or rock crevices, has generalist feeding habitats, and usually forages in deciduous forest areas.	P (N,P,S)
Long-legged myotis *Myotis volans*	FSC	Wooded habitats in pinyon-juniper and coniferous forests, between 4,000 and 9,000 feet.	L (N,P,S)
Mexican free-tailed bat *Tadarida brasillensis*	N	Occupies a variety of habitats from sea level to 9,000 feet, usually roosts in large colonies in caves and under bridges.	U
Pacific Townsend's big-eared bat *Corynorhinus townsendii townsendii*	FSC/B	Lives in cliffs, caves, and old mines between sea level and 3,500 feet.	U
Pale Townsend's big-eared bat *C. t. pallescens*	FSC	Roosts in caves, lava tubes, and abandoned mines between low arid desert to upper fir zone.	U
Pygmy rabbit *Brachylagus idahoensis*	FSC	Burrows in deep loose soil in tall sagebrush habitat.	P (N,P,S)
Western small-footed myotis *Myotis ciliolabrum*	FSC/B	Raises young in cliff faces and erosion overhangs, hibernates in caves and mines. Requires water, often seen to drink soon after emergence.	P (N,P,S)
Silver-haired bat *Lasiurus cinereus*	N	Roosts almost exclusively in hollow trees and cavities in old-growth forest.	U
Spotted bat *Euderma maculatum*	FSC/B	Lives in desert scrub and open forested areas, roosts in cliff faces and rock crevices.	P (N,P,S)
Yuma myotis *Myotis yumanensis*	FSC	Typically forages over water in forested areas and roosts in caves, mines, buildings, and bridges.	U
Long-eared myotis *M. evotis*	FSC	Roosts in buildings, crevices, spaces under bark and snags. Caves are used primarily as night roosts. Requires water, forages among trees, over water, and over shrubs.	U (N,P,S)
Fringed myotis *M. thysanodes*	FSC	Roosts in caves, mines, buildings, and crevices. Requires water, forages over water and open habitats.	U (N,P,S)

Table 3-6
Sensitive Species that Potentially Occur Within the Project Area *(continued)*

Species	Status	Habitat	Likelihood of Occurrence in Study Area (route)[1]
Fish			
Lahontan cutthroat trout *Oncorhynchus clarki henshawi*	FT	Rivers, lakes, and streams, primarily in the Walker, Truckee, and Carson basins of Nevada.	U
Birds			
Bald eagle *Haliaeetus leucocephalus*	FT	Wetlands and open water.	U
Black tern *Chlidonias niger*	FSC	Wetlands and open water.	U
Least bittern *Ixobrychus exilis hesperis*	FSC	Wetlands and open water.	U
Sage grouse *Centrocercus urophasianus*	FSC	Generally prefers successional scrub habitat.	P (N,P,S)
Western burrowing owl *Athene cunicularia hypugea*	FSC	Friable substrate with ground squirrel burrows.	L (N,P,S)
White-faced ibis *Plegadis chihi*	FSC	Wetlands and open water.	U
Invertebrates			
California floater *Anodonta californiensis*	FSC	Shallow areas of clean lakes, ponds, and large rivers.	U
Carson wandering skipper *Pseudocopaeodes eunus obscurus*	FE	Grassland habitats on alkali substrates.	P (N)
Mono checkerspot *Euphydryas editha monoensis*	B	Found in wet meadows and pine forests in foothills and high mountains.	U
Nevada viceroy *Limenitis archippus lahontani*	FSC	Moist open or shrubby areas, such as pond edges, valley bottoms, and wet meadows.	U
Carson Valley wood nymph butterfly *Cercyonis pegala carsonensis*	FSC	Generally found at the edges of swampy meadows. Entire population is thought to exist in only one meadow in Douglas County.	U (N,S)
Peavine blue butterfly *Euphilotes enoptes aridorum*	FSC	Generally found at the edges of swampy meadows.	U (N,S)
Plants			
Altered andesite buckwheat *Eriogonum robustum*	FSC	Found in gravelly clay soils in scrub and woodland habitat.	P (N,P,S)
Ames milkvetch *Astragulus pulsiferae* var. *pulsiferae*	B	Dry, open, rocky, or sandy habitat in pine or scrub habitat.	L (N,P,S)
Webber's ivesia *Ivesia webberi*	FC	Generally found in volcanic ash substrate in sagebrush scrub habitat.	L (N,P,S)
Margaret's rushy milkvetch *Astragulus convallarius* var. *margaretiae*	N	rocky slopes and flats in sagebrush and pinyon-juniper habitat.	L (N,P,S)
Nevada oryctes *Oryctes nevadensis*	FSC	Generally found in sandy soil in creosote bush scrub or shadscale scrub habitat.	U

Table 3-6
Sensitive Species that Potentially Occur Within the Project Area *(continued)*

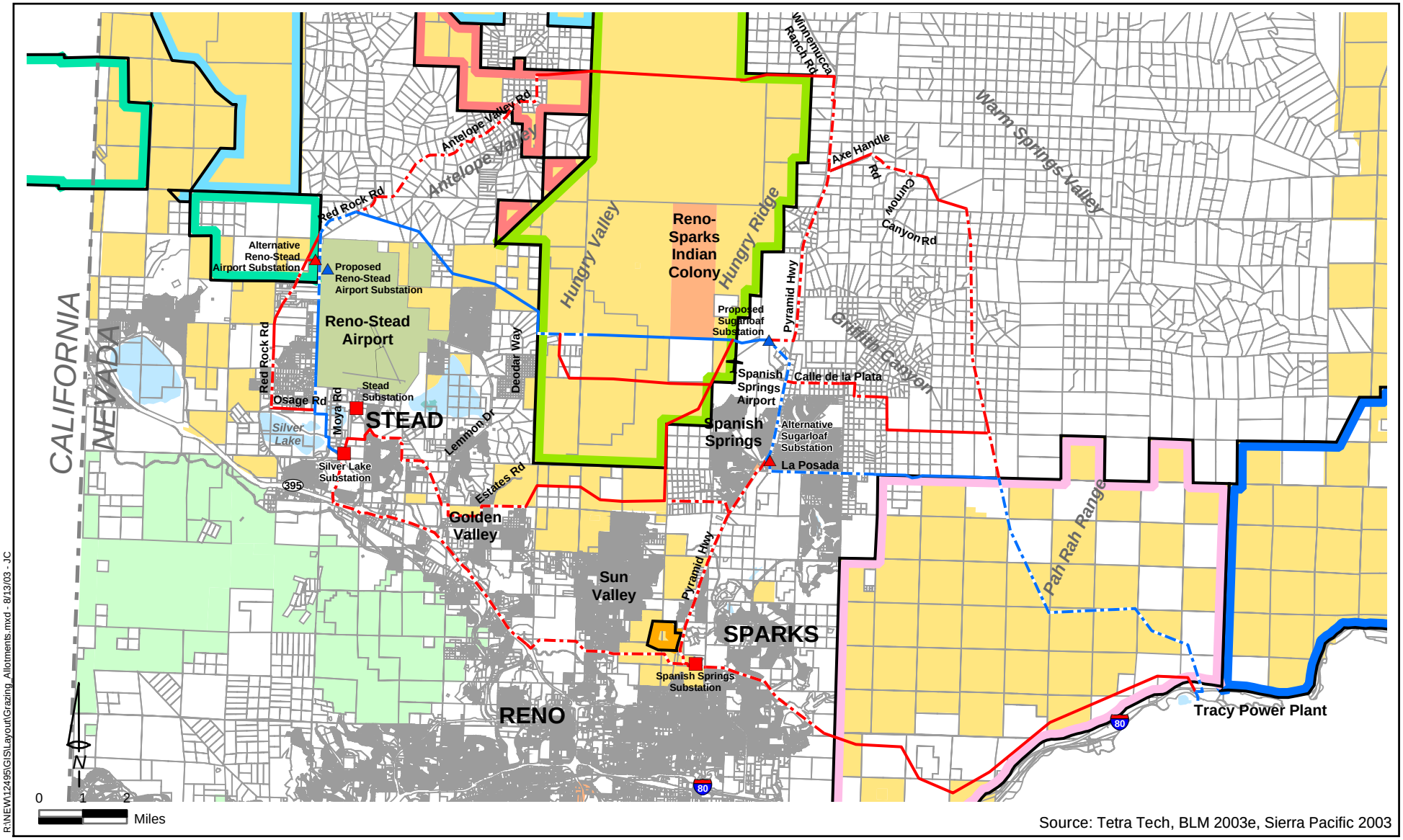
Species	Status	Habitat	Likelihood of Occurrence in Study Area (route)[1]
Sierra Valley mousetails *Ivesia aperta* var. *aperta*	B	Generally found in volcanic substrate, in sagebrush scrub, yellow pine forest, and northern juniper woodland.	L (N,P,S)

Sources: Calflora 2002; NNHP 2002; USFWS 2002; BCI 2002.

Notes:
Status
FE = Federal endangered species
FT = Federal threatened species
FC = Federal candidate species
FSC = Federal species of concern
N = Considered sensitive by the Nevada Natural Heritage Program
B = Considered sensitive by the Bureau of Land Management

Likelihood of Occurrence:
L = Viable habitat for this species exists in the project area, and the species is known to exist in the region.
P = The species has been reported in the region, and some habitat may exist in the project area.
U = There is no viable habitat for this species in the project area.

[1]Alternative routes
N = Alternative northern route
P = Proposed route
S = Alternative southern route



Source: Tetra Tech, BLM 2003e, Sierra Pacific 2003

There are seven grazing allotments within the project area, ranging from 450 acres to 71,514 acres of public land and totaling 7,405 AUMs of grazing preference.

Legend

Routes
- Proposed Route
- Proposed Route (incorporating existing line)
- Alternative Route
- Alternative Route (incorporating existing line)

Substations
- Existing Substation
- Proposed Substation
- Alternative Substation

Grazing Allotments
- Olinghouse
- Paiute
- Red Rock
- Plumas Station
- Antelope Mountain
- Spanish Springs/Mustang
- Wedekind

Land Status
- Bureau of Land Management
- Native American Reservation
- Private
- County/City Parks
- US Forest Service
- Water
- Airport Authority of Washoe County

Tetra Tech, Inc

Grazing Allotments

Tracy to Silver Lake
120 kV Transmission Line

Washoe County, Nevada

Figure 3-6

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Wedekind

The Wedekind Allotment is made up of 450 acres of public land. The allotment does not have a current permit, but preference exists for 73 cattle from April 15 to June 15 (this means that a new permit may be issued for these numbers and season of use at some time in the future). The Wedekind Allotment is composed of 123 AUMs (Suminski 2002).

Red Rock

The Red Rock Allotment is composed of 3,560 acres of public land permitted for 69 cattle during the April 15 to October 3 grazing season and is made up of 454 AUMs (Suminski 2002).

Paiute

The Paiute Allotment is composed of 71,514 acres of public land, is currently permitted for 408 head of cattle yearlong, and is made up of 4,798 AUMs (Suminski 2003a).

Plumas Station

The Plumas Station Allotment is composed of 5,432 acres of public land, is currently permitted for 41 cattle during the April 1 to September 30 grazing season, and is made up of 244 AUMs (Suminski 2003b).

AESTHETIC RESOURCES AND NOISE

This section is a description of the visual quality of lands within 1.5 miles on either side of the transmission line routes, staging areas, and substation sites. One mile is generally the extent at which human-made features are visible; in general, features beyond this zone are so distant that only forms and outlines are discernable and visual impacts are negligible. Visual resources, according to the BLM, are the visible physical features on a landscape, such as land, water, vegetation, animals, and structures (BLM 2003a).

This section also describes the level of noise in the study area, which is 150 feet on each side of the transmission line routes, staging areas, and substation sites.

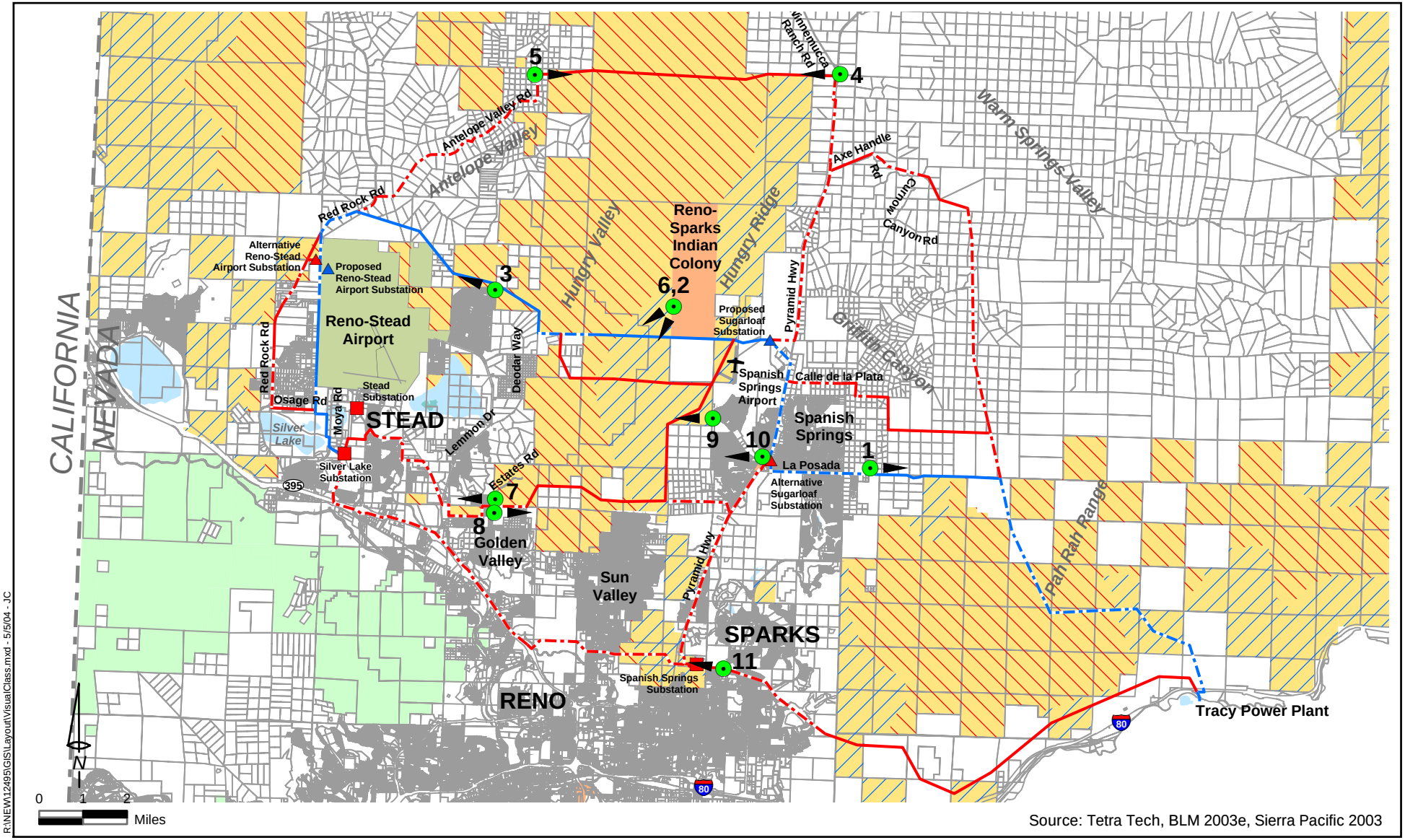
Aesthetic Resources

BLM is responsible for ensuring that the scenic values of public lands are considered before allowing uses that may have negative visual impacts. BLM addresses this through its visual resource management (VRM) system. There are four VRM classes and management objectives (BLM 2003b):

- Class I Objective—"To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention."
- Class II Objective—"To retain the existing character of the landscape. The level of change to the characteristic landscape should be low."
- Class III Objective—"To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate."
- Class IV Objective—"To provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high."

The visual contrast rating stage (described in BLM Handbook H-8431-1, Visual Resource Contrast Rating) (BLM 2003c) involves determining whether potential visual impacts from proposed surface-disturbing activities or developments would conform to management objectives established for the area or whether project design adjustments would be required. Using the analysis from the visual contrast rating worksheet as a guide, attempts can be made to reduce visual impacts caused by a project (BLM 2003c). VRM classes for BLM land within the project area are categorized as either Class III or IV (Figure 3-7). VRM classes and their associated resources management objectives apply only to BLM land.

The *Regional Utility Corridor Report* provides the following policy on visual resources (Regional Utility Corridor Citizens Advisory Committee 2004):



Source: Tetra Tech, BLM 2003e, Sierra Pacific 2003

BLM uses its visual resource management (VRM) system to ensure the scenic values of public lands are protected. Key observation points (KOPs) are also used by the BLM to analyze impacts to visual resources.

Legend

Routes
- Proposed Route
- Proposed Route (incorporating existing line)
- Alternative Route
- Alternative Route (incorporating existing line)

Other Features
- Existing Substation
- Proposed Substation
- Alternative Substation
- Key Observation Points
- Photo Direction

BLM Visual Resource Classes
- 3
- 4

Land Status
- Bureau of Land Management
- Native American Reservation
- Private
- County/City Parks
- US Forest Service
- Water
- Airport Authority of Washoe County

Tetra Tech, Inc

Visual Resource Management Classes and Key Observation Points

Tracy to Silver Lake
120 kV Transmission Line

Figure 3-7

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- Section F.7: "New overhead utilities shall be located to take advantage of existing topographic features to minimize visual impacts."
- Section F.8: "New overhead utilities shall be constructed so as to minimize the disturbance to and/or alteration of the natural environment. For example, alignments could avoid crossing hills at right angles to the contours and could cross wooded hills and mountains at an oblique angle to minimize the focus of attention on the overhead utility."
- Section F.9: "In siting new overhead utilities, consideration shall be given to minimizing disruption of existing land use patterns. New overhead utilities shall parallel existing roads, fence lines, windbreaks, or other major patterns in the area or be moved back from the road when land use and visual impacts are reduced by so doing."

Area Plans in the Washoe County Comprehensive Plan address visual resources. Examples of policies from the area plans are provided below (Washoe County 2003a):

- Spanish Springs Area Plan Policy SS.1.1.1: "A minimum 25-foot buffer should be provided between all property lines and right-of-ways (sic) along all arterial streets. No fences, walls or structures shall be permitted in these areas. Development designs shall be encouraged to maintain a compatible landscaping theme for buffer areas throughout the planning area."
- Spanish Springs Area Plan Policy SS.1.1.2: "Encourage the underground placement of primary, distribution, secondary, and service lines and other utilities for new development in the planning area."
- Spanish Springs Area Policy SS.2.2.2: "The Development Suitability map identifies significant ridgelines in the Spanish Springs planning area which are to be protected from future development."
- Warm Springs Area Plan Policy WS.1.3: "Preserve the scenic resources and views of the Warm Springs planning area as seen from the Pyramid Lake Highway. Future development should be set back a sufficient distance from Pyramid Lake Highway to ensure that the scenic views of the wide valley floor and surrounding ridges and mountains are not degraded. Future development adjacent to Pyramid Lake Highway should complement and enhance the rural character of the planning area."
- Sun Valley Area Plan Policy SUN.1.1.1: "Development on hillsides shall disturb the smallest area possible. Disturbed soils should be revegetated as soon as practical. Drought tolerant/fire resistant species should be used where appropriate."
- Truckee Canyon Area Plan Policy TC.1.1.1: "A minimum 25-foot buffer should be provided between all property lines and rights-of-way along all arterial streets. No fences, walls or structures shall be permitted in these areas. At time of subdivision application review, a landscape theme should be evaluated."
- Truckee Canyon Area Plan Policy TC.1.3.1: "Proposed developments shall be reviewed to ensure the view from Interstate 80 is preserved. Height limitations and setbacks will help preserve the visually predominant ridges and escarpments."
- North Valleys Area Plan Policy NV.1.1.1: "Development on hillsides shall disturb the smallest area possible. Disturbed soils should be re-vegetated as soon as is practical. Drought tolerant/fire resistant species should be used where appropriate."
- North Valleys Area Plan Policy NV.1.1.2: "During development review, preference will be given to proposals that minimize hillside development or otherwise conserve steep slopes."
- North Valleys Area Plan Policy NV.1.2.2: "Proposed developments shall be reviewed to

ensure the view from US 395 is preserved. Height limitations and setbacks will help preserve the visually prominent ridges and escarpments."

The Washoe County Scenic Resources map in the Washoe County Comprehensive Plan does not identify any scenic resources in the study area (Washoe County 2003a). Special buffering standards in the Spanish Springs Specific Plan help maintain a rural open space character and the views of the surrounding hillsides (Washoe County 2003a).

The Washoe County Development Code, Article 424 – Hillside Development establishes provisions for developing, preserving, and protecting hillsides and ridgelines within Washoe County. One of the intents of the regulations is to protect the public health, safety, and welfare by minimizing impacts on prominent ridgelines, significant viewsheds, canyons, and visually prominent rock outcroppings that reflect the visual value and scenic character of hillside areas. For example, Section 110.424.40 states that "existing native trees and vegetation shall be retained and integrated into the site development plan to the maximum extent feasible so as to maintain the natural surface drainage system, protect and preserve ecological communities, and enhance the natural scenic and visual quality" (Washoe County 2003b).

The scenic features of the area are composed of natural features and cultural modifications. A cultural modification is "any man-caused change in the land form, water form, vegetation, or the addition of a structure which creates a visual contrast in the basic elements (form, line, color, texture) of the naturalistic character of a landscape" (BLM 2003a). Natural scenic features are characteristic of the Great Basin area of the western United States. The form, line, color, and texture of the Great Basin landscape are influenced by the arid climate. Gold and brown hills diffuse into steep rugged mountains, and the blue sky can be dotted with fluffy clouds and thunderclouds at times. Sunlight is a dominating element in the area, and whirling winds create dust funnels (US Navy 2000; BLM 1974). Low desert brush dominates the valley lowlands, allowing expansive views from the valleys to the surrounding mountains. The higher elevations support sagebrush, juniper, and pinyon pine that provide visual diversity and contrasting darker color along ridgelines in the distant background. Vegetation typically grows low and evenly on the valley floor and primarily consists of monochromatic desert brush.

Visual sensitivity in the area of the project is primarily related to major roads and population centers. Major roadways include Highway 395, Interstate 80, Pyramid Highway, Red Rock Road, and Antelope Valley Road. The closest population centers from which people could view portions of the Proposed Action include the cities of Reno and Sparks, as well as various surrounding unincorporated areas and the Reno-Sparks Indian Colony. These are usually commercial or residential areas.

Spanish Springs

The Spanish Springs planning area has various outstanding scenic resources. The Pyramid Highway corridor as it passes through Spanish Springs provides views of rugged mountain slopes and pasture/open areas, which define Spanish Springs Valley. Lands most suitable for development lie in the Spanish Springs Valley and are surrounded by the Pah Rah Range and Hungry Ridge. Contrasts of color and elevation make these mountains an important visual resource, and the area around Sugar Loaf Peak provides an outstanding view of Mt. Rose, the cities of Reno and Sparks, Hungry Ridge, and most of the Spanish Springs Valley (Washoe County 2003a).

Warm Springs

The Warm Springs planning area has various outstanding scenic resources. The Pyramid Highway corridor offers views of rugged mountain terrain and broad open valleys. The planning area is surrounded by Hungry Ridge, the Dogskin Mountains, the Virginia Mountains, and the Pah Rah Range and contrasts of color and elevation make these

mountains an important visual resource (Washoe County 2003a).

Sun Valley

The Sun Valley planning area contains several scenic resources. The contrasts of color, vegetation, and elevation provided by the area's mountains and foothills contribute aesthetic opportunities to the entire region (Washoe County 2003a).

Truckee Canyon

The Truckee Canyon planning area has various outstanding scenic resources. The scenic corridor, from Interstate 80 as it passes through the Truckee Canyon planning area, provides views of rugged mountain slopes and escarpments, which define the Truckee Canyon, and contrasts of color and elevation make these mountains an important visual resource (Washoe County 2003a).

North Valleys

The North Valleys planning area has many scenic resources. Contrasts of color, vegetation, and elevation can be found in the area's mountains, foothills, and playas (Washoe County 2003a).

Key Observations Points

Eleven key observation points, or KOPs, are used to analyze impacts to visual resources. A KOP is one or a series of points on a travel route or at a use area or a potential use area where the view of a management activity would be most revealing. The locations of the KOPs are identified in Figure 3-7; photos taken from the KOPs depicting the visual resources are provided in Appendix F. The KOPs include the following:

Proposed Action

KOP 1. Eastern end of La Posada (facing southeast);

KOP 2. Reno-Sparks Indian Colony (facing southwest); and

KOP 3. Developed area just northwest of Deodar Way (facing northwest toward ridge);

Northern Alternative

KOP 4. Winnemucca Ranch Road and Pyramid Highway intersection (facing west); and

KOP 5. Antelope Valley Road and Destiny Court intersection (facing east);

Calle de la Plata Alternative

Use KOP 3 above, as well as KOP 6, Reno-Sparks Indian Colony (facing southwest);

Southern Alternative

Use KOP 1 above, as well as the following:

KOP 7. Golden Valley at Estates Road (facing west); and

KOP 8. Golden Valley at Estates Road (facing east);

Foothills Alternative

Use KOPs 1, 7, and 8 above, as well as the following:

KOP 9. Calle de la Plata and Eagle Canyon intersection (facing west); and

KOP 10. Residential area east of foothills along Hungry Ridge (facing west); and

Existing Routes Alternative

KOP 11, east of Spanish Springs Substation (facing west toward the substation).

Noise

The Washoe County Comprehensive Plan addresses noise issues in the Land Use and Transportation Element. Policy LUT.1.14 includes the identification of noise impacts associated with the proposed use, based on the residential noise standard. The residential and nonresidential noise standard states that sound attenuation measures shall be adhered to in areas where noise levels are exceeded more than 10 percent of the time. The recommended average daily noise level (outdoors) for residential land uses is 65 day-night sound level (Ldn) the recommended average daily noise level (indoors) for residential land uses is 50 Ldn. Also, an average daily noise level (outdoors) of 65 Ldn is recommended for nonresidential land uses adjacent to residential land uses (Washoe County 2003a).

The ambient noise of a given environment is the all-encompassing sound associated with that environment. Sources of noise in the study area include animals, vehicles, the wind, aircraft, and residential, commercial, and industrial activities. Sensitive receptors are people and animals that would be affected by noise generated by the Proposed Action. Examples of noise-sensitive land uses include residences, hotels, churches, auditoriums, schools, libraries, hospitals, and parks.

HAZARDOUS MATERIALS

The transmission line routes outlined for the Proposed Action and associated substations are primarily on undeveloped land, and no hazardous materials are suspected at any of the sites.

PUBLIC HEALTH AND SAFETY

This section discusses public health and safety concerns as related to transmission lines and the associated infrastructure. Key issues addressed are fire, electric and magnetic fields (EMF), and airspace, as related to aircraft safety.

Fire

Lands managed by the CCFO are assigned fire management categories in the CRMP. The Proposed Action would occur on lands designated by BLM as Categories B or C. Category B is for areas where wildfires are not wanted, and Category C is for areas where fire has an important role in the environment, and naturally occurring wildfires should be used to accomplish resource management goals. Almost all of 21N21E, all of 22N21E, and the western portions of 21N20E and 22N20E are designated Category C; the remaining areas of the project are designated Category B (BLM 2001a).

Portions of Spanish Springs, Truckee Canyon, Sun Valley, North Valleys, and Warm Springs planning areas are areas of extreme wildfire potential, especially in areas with desert shrub and junipers. Wildfires in these areas burn very rapidly and are difficult to control. Pinyon pine forests are also a wildfire concern in the Sun Valley planning area. The BLM, Reno Sparks Indian Colony, Reno Fire Department, and the City of Sparks provide fire protection within the project area.

Electric and Magnetic Fields

The generation, delivery, and use of electricity produce electric and magnetic fields. EMF is a term used to describe electric and magnetic fields that are created by electric voltage (electric field) and electric current (magnetic field).

Electric Fields

The change in voltage over distance is known as the electric field. The units describing an electric field are volts per meter (V/m) or kilovolts per meter (kV/m). This is a measure of the difference in electrical potential or voltage between two points one meter apart. The electric field becomes stronger near a charged object and decreases with distance away from the object.

All household appliances and other devices that operate on electricity create electric fields. Fields produced by electrical appliances that use alternating current (AC) reverse direction at a frequency of 60 cycles per second (60 Hertz, or Hz). The magnitude of the electric field decreases rapidly with distance from the device. The field caused by point source (compact, small-dimension) household appliances generally attenuates more rapidly with distance than line source fields (such as from power lines).

Typical electric field levels in the home and at work are less than 0.1 kV/m. Electric fields within one foot of small appliances are in the range of 0.02 to 0.2 kV/m, while the field immediately adjacent to the heating wires of an electric blanket can approach 10 kV/m (University of Missouri 2003).

Electric power transmission lines create 60 Hz electric fields. These fields result from the voltage of the transmission line phase conductors with respect to the ground. Electric field strengths from a transmission line decrease with distance away from the outermost conductor, typically at a rate of approximately one divided by the distance squared

($1/d^2$). As an example, in an unperturbed field, if the electric field strength were 1.0 kV/m at a distance of one meter away, it would be approximately 0.25 kV/m at 2 meters away and 0.0625 kV/m at 4 meters away. Electric field strength for a transmission line remains nearly constant over time because the voltage of the line is kept within bounds of about ±5% of its rated voltage.

Electric power substations also create electric fields due to voltage on station components. The equipment, or components of a substation, acts as point sources of an electric field, similar to appliances in a home. As the distance from these point sources becomes greater than the physical size of the equipment acting as a source, the field is greatly reduced; this is also true for substation components. The electric fields of station equipment (such as transformers and circuit breakers) decrease outside a substation at a rate of approximately one divided by the distance cubed ($1/d^3$), unless an overhead power line is nearby. For example, a field of 1.0 kV/m at one meter away would be approximately 0.125 kV/m at two meters away and 0.0156 kV/m at four meters away. Substation electric fields outside the fenced equipment area are typically very low because of shielding by metallic substation components themselves, as well as by the metal fencing surrounding the substation.

Magnetic Fields

An electric current flowing in a conductor (such as in electric equipment, household appliances, and power circuits) creates a magnetic field. The most commonly used magnetic field intensity unit of measure is the gauss. For most practical applications, the gauss is too large, so a much smaller unit, the milligauss (mG), is used for reporting magnetic field magnitudes. The milligauss is one thousandth of a gauss. As a general reference, the earth has a natural static or direct current (DC) magnetic field of about 500 mG in Nevada. As with electric fields, the magnetic fields from electric power facilities and appliances differ from static (or DC) fields because they are caused by the flow of 60 Hz alternating currents. Power frequency magnetic fields correspond to the 60 Hz operating frequency of the power systems in the US. Table 3-7 provides examples of magnetic fields from household appliances.

The current flowing on the phase conductors generates transmission line magnetic fields. Similar to the electric field, field strengths decrease with distance away from the line. Unlike electric fields that vary little over time, magnetic fields are not constant because the current on any power line changes in response to increasing and decreasing electrical load.

Electric power substations also create magnetic fields due to current flow in station components. Because a substation is a collection of components, each of which can be a magnetic field source, a substation complex is often treated as a single point source for external field measurements taken at a distance. External magnetic fields associated with the substation (e.g., the collection of equipment or components) can be considered separately from the magnetic fields associated with the power lines that serve the substation. The manner in which substation component magnetic fields attenuate with distance is similar to that from appliances, where the field strengths diminish rapidly as the distance from the source grows larger than the dimensions of the source itself (for example, a transformer). Therefore, at distances on the order of 50 feet or more from the substation fence, the external magnetic field would have decreased to a much lower level than the level inside the substation. In contrast to electric fields, the substation magnetic fields are not affected significantly (shielded) by most common objects.

Extremely Low Frequency Electric and Magnetic Fields Health Study

The production of weak EMF is associated with the generation, transmission, and use of electrical energy. Extremely low frequency (ELF) EMF has cycle frequencies of greater than 3 Hz and less than 300 Hz. In the US, electricity is usually delivered as alternating current that oscillates at 60 Hz (NIEHS 2002a).

Table 3-7
Magnetic Fields from Household Appliances

	Magnetic Field (mG)	
Appliance	**12 Inches Away**	**Maximum Strength**
Electric Range	3 to 30	100 to 1,200
Electric Oven	2 to 25	10 to 50
Garbage Disposal	10 to 20	850 to 1,250
Refrigerator	0.3 to 3	4 to 15
Clothes Washer	2 to 30	10 to 400
Clothes Dryer	1 to 3	3 to 80
Coffee Maker	0.8 to 1	15 to 250
Toaster	0.6 to 8	70 to 150
Crock pot	0.8 to 1	15to80
Iron	1 to 3	90 to 300
Can Opener	35 to 250	10,000 to 20,000
Mixer	6 to100	500 to 7,000
Blender, Food Processor	6 to 20	250 to 1,050
Vacuum Cleaner	20 to 200	2,000 to 8,000
Portable Heater	1 to 40	100 to 1,100
Fan/Blower	0.4 to 40	20 to 300
Hair Dryer	1 to 70	60 to 20,000
Electric Shaver	1 to 100	150 to 15,000
Color TV	9 to 20	150 to 500
Fluorescent Light Fixture	2 to 40	140 to 2,000
Fluorescent Desk Lamp	6 to 20	400 to 3,500
Circular Saw	10 to 250	2,000 to 10,000
Electric Drill	25 to 35	4,000 to 8,000

Source: SPPCo 2003

In 1992, Congress authorized the Electric and Magnetic Fields Research and Public Information Dissemination Program (EMF-RAPID Program) in the Energy Policy Act (NIEHS 2002a). The EMF-RAPID Program was funded jointly by federal and matching private funds, with substantial financial support from the utility industry. Congress instructed the National Institute of Environmental Health Sciences (NIEHS) and the Department of Energy to direct and manage a program of research and analysis aimed at providing scientific evidence to clarify the potential for health risks from exposure to ELF-EMF. (The NIEHS is one of 25 institutes and centers of the National Institutes of Health, a component of the Department of Health and Human Services.) The EMF-RAPID Program had the following three basic components:

- A research program focusing on health effects research;
- Information compilation and public outreach; and
- A health assessment for evaluating any potential hazards arising from exposure to ELF-EMF.

The NIEHS was directed to oversee the health effects research and evaluation (NIEHS 2002a). Upon completion of the program, the director of the NIEHS was mandated to provide a report outlining the possible human health risks associated with

exposure to ELF-EMF. The document that responds to this requirement of the law is the *NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*.

In the report, the NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In the opinion of the NIEHS, "this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted, such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or non-cancer health outcomes provide sufficient evidence of a risk to currently warrant concern" (NIEHS 2002a).

There are no federal standards limiting occupational or residential exposure to 60-Hz EMF. At least six states have set standards for transmission line electric fields, and two of these states also have standards for magnetic fields. In most cases, the maximum fields permitted are the maximum fields that existing lines produce at maximum load carrying conditions in each state. The most stringent state standard for electric fields on the ROW is 7.0 kV/m. The most stringent state standard for electric fields at the edge of the ROW is 1.0 kV/m. The second most stringent state standard for electric fields at the edge of the ROW is 1.6 kV/m. The most stringent state standard for magnetic fields at the edge of the ROW is 150 mG under maximum loading of 69 to 230 kV lines. To ensure that electric current induced into large metal objects, such as trucks and buses, does not represent an electric shock hazard, some states further limit electric field strength at road crossings (NIEHS 2002b).

Regional Utility Corridor Report

The *Regional Utility Corridor Report* provides policies and guidelines for electric power lines of 60 kV or greater and facilities (Regional Utility Corridor Citizens Advisory Committee 2004). For current corridors and sites where the utility proposes and infrastructure upgrade or expansion, the principle of "no net increase in EMF exposure" shall apply. According to section F4 (Table 1), "the location of new overhead utilities, residential developments, schools, daycare facilities and healthcare facilities shall be such that the separation between occupied or inhabited structures and overhead utilities located in either existing or new corridors shall be" 150 feet from the transmission line centerline for 120 kV overhead utilities (Regional Utility Corridor Citizens Advisory Committee 2004).

AIRSPACE

Federal Aviation Regulation Part 77, Objects Affecting Navigable Airspace, protects the airspace and approaches to the runways from hazards that could affect the safe and efficient operation of the airport. The distance requirement for airspace safety is based on a distance to height of poles ratio. Also, Federal Aviation Administration form 7460-1, Notice of Proposed Construction, would need to be submitted at least 30 days prior to construction.

Reno-Stead Airport

The primary runway for the airport is Runway 8-26, the western end of which is near the western property line for the airport (Coffman Associates, Inc. 1994).

The transmission line routes of the Proposed Action and all of the alternatives would cross land owned by the Airport Authority of Washoe County. The 5,000-acre general aviation airport serves as a reliever airport for Reno/Tahoe International Airport. In addition to serving general aviation traffic, the Stead Airport hosts aviation special events (Airport Authority of Washoe County 2002). For example, in September, the airport is host to the National Championship Air Races and Air Show, which first began in 1964. There are multiple air race courses, and the northern and eastern portions of the largest of the air race courses extend beyond the boundary of the airport. The air race course pylon closest to the western property line of the airport is

approximately 1,000 feet east (Coffman Associates, Inc. 1994). The pylons themselves are telephone poles about 50 feet tall, with striped drums at their tops. Many of the pylons have bright orange-red panels to increase their visibility to pilots, who may be traveling anywhere from 150 to almost 500 mph on the race course (Reno Air Racing Association 2003).

The safety zone for the air race courses extends to the western property line of the airport for most of the property line north of Runway 8-26 (Jeff Codega Planning/Design, Inc. 2000). There are utility poles and lines on approximately the northern third of the airport's property and approximately 30 feet east of the western property line fence.

Spanish Springs Airport

The Spanish Springs Airport is west of Pyramid Highway, north of Eagle Canyon Drive in Spanish Springs, east of Hungry Ridge, and southwest of the proposed Sugarloaf Substation (Figure 3-8). The airport is on 35 acres of leased land from the BLM, and there is one 3,016-foot dirt runway, oriented approximately north-south. The northern end of the runway is approximately 500 feet south of the Proposed Action, Calle de la Plata Alternative, and Foothills Alternative transmission line routes and approximately 1,200 feet east of the Foothills Alternative and Calle de la Plata Alternative transmission line routes. The distance requirement for airspace safety is based on a distance to height of poles ratio. The specific ratio for this particular airport is 1,000 feet to 50 feet (or 20:1) (Moyers 2003).

AIR RESOURCES

Meteorology, climate conditions, and air pollutant types and quantities characterize ambient air quality. Air quality regulations for the Proposed Action area fall under the jurisdiction of the USEPA, the Nevada Department of Environmental Protection's Bureau of Air Quality Planning (NDEP BAQ), and the Washoe County District Health Department (WCDHD) Air Quality Management Division.

Climate and Meteorology

The regional climate is a cold desert, with the surrounding mountains protecting the area from arctic cold air masses from the north and maritime effects from the west. Most precipitation from the west is dispersed as it crosses the Sierra Nevada range, so little precipitation falls in the area immediately east, an effect known as a "rain shadow." Winters are moderately cold, with recordable amounts of snowfall. Summers are moderate, with occasional high temperatures of 90 to 100 degrees Fahrenheit (F). Rain falls occasionally in summer.

The average annual maximum temperature range for the project area is 63.9 to 67.6 °F. The average annual minimum temperature range is 33.4 to 36.4 °F. In the area, the warmest month is July, with an average maximum temperature near 90 °F and average minimum near 52 °F. The coldest month is January, when the average maximum temperature is close to 45 °F and the average minimum temperature is about 22 °F. Average annual precipitation in Reno is 7.35 inches, 12.12 inches in Stead, and 8.38 inches in Sparks. Annual average snowfall in Reno is 22.8 inches, 15.1 inches in Stead, and 5.6 inches in Sparks (DRI 2001).

The prevailing wind direction in the Reno area is west-northwest; however, the predominant wind direction during the winter is south. The average annual wind speed is 6.6 miles per hour. The highest wind speed average occurs in April, and gusts as high as 90 mph have been recorded (DRI 2001). Inversions are a regular occurrence in Reno. Inversions can occur on any given day but are most common in the winter, evenings, and mornings. Inversions are affected by dry weather, changing air temperature, and changing ground temperature. Inversions can be overcome by high winds when good ambient air mixing occurs and temperatures in the upper and lower atmosphere equilibrate.

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Source: Tetra Tech, BLM 2003e, Sierra Pacific 2003 Image: BLM 1996

The Spanish Springs Airport is 35 acres of leased BLM property and there is one 3,016-foot dirt runway.

Legend

- Proposed Route
- Proposed Route (incorporating existing line)
- Alternative Route
- Alternative Route (incorporating existing line)
- Proposed Substation
- Roads

Spanish Springs Airport

Tracy to Silver Lake 120 kV Transmission Line

Washoe County, Nevada

Figure 3-8

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Criteria Pollutants

The USEPA has designated six criteria pollutants that are focused on for improving air quality throughout the country. Nevada and Washoe County have also adopted these criteria pollutants, which include the following: carbon monoxide (CO); lead (Pb); nitrogen dioxide (NO_2); ozone (O_3); inhalable and fine particulate matter (PM_{10} and $PM_{2.5}$); and sulfur dioxide (SO_2).

The USEPA has established standards for each pollutant that must not be exceeded. Nevada and Washoe County have the right to establish more stringent state or county standards but may not lessen the federal standards. With minor exceptions, Nevada and ambient air quality standards must not be exceeded in areas where the general public has access. Table 3-8 compares the National Ambient Air Quality Standards with those of Nevada and Washoe County. National primary standards are levels of air quality necessary to protect the public health, while secondary standards to protect the public welfare from known or anticipated adverse effects or a regulated air pollutant. If a county meets the federal or state air quality standards it is considered to be in "attainment."

Table 3-8
Air Quality Standards

		Nevada/Washoe County Standards	National Ambient Air Quality Standards	
Pollutant	**Averaging Time**	**Concentration**	**Primary**	**Secondary**
Ozone	1 hour	235 μg/m³ 0.12 ppm	235 μg/m³ 0.12 ppm	235 μg/m³ 0.12 ppm
Ozone – Lake Tahoe Basin #90	1 hour	195 μg/m³ 0.10 ppm	235 μg/m³ 0.12 ppm	235 μg/m³ 0.12 ppm
Carbon dioxide (<5,000 feet msl)	8 hour	10,000 μg/m³ 9.0 ppm	10,000 μg/m³ 9.0 ppm	NA
Carbon dioxide (> 5,000 feet above msl)	8 hour	6,670 μg/m³ 6.0 ppm	10,000 μg/m³ 9.0 ppm	NA
Carbon monoxide	1 hour	40,000 μg/m³ 35 ppm	40,000 μg/m³ 35 ppm	NA
Nitrogen dioxide	Annual arithmetic mean	100 μg/m³ 0.05 ppm	100 μg/m³ 0.05 ppm	100 μg/m³ 0.05 ppm
Sulfur dioxide	Annual arithmetic mean	80 μg/m³ 0.03 ppm	80 μg/m³ 0.03 ppm	NA
	24 hours	365 μg/m³ 0.14 ppm	365 μg/m³ 0.14 ppm	NA
	3 hours	1,300 μg/m³ 0.5 ppm	NA	1,300 μg/m³ 0.5 ppm
Particulate matter as PM_{10}	Annual arithmetic mean	50 μg/m³	50 μg/m³	50 μg/m³
	24 hours	150 μg/m³	150 μg/m³	150 μg/m³
Particulate matter as $PM_{2.5}$	Annual arithmetic mean	NA	15.0 μg/m³	15.0 μg/m³
	24 hours	NA	65 μg/m³	65 μg/m³
Lead	Quarterly arithmetic mean	1.5 μg/m³	1.5 μg/m³	1.5 μg/m³

Source: NDEP 2002
Notes:
msl = mean sea level
NA = not applicable
ppm = parts per million (by volume)
μg/m³ = micrograms per cubic meter
> = greater than
< = less than
Concentrations are referenced to 25° Celsius and 760 millimeters of mercury

Washoe County is in attainment for lead, SO_2, and NO_2 but is in not in attainment for CO, PM_{10}, and O_3, meaning that Washoe County exceeded the criteria pollutant concentration limits established by the USEPA and WCDHD. Specifically, the Truckee Meadows hydrographic basin (the Reno/Sparks area) has been designated moderate nonattainment (measured as less than or equal to 12.7 parts per million) for CO, based on 8-hour concentrations. However, the last time the CO standard was exceeded was recorded on December 13, 1991 (NDEP 2001).

The Truckee Meadows hydrographic basin has been designated as being in serious nonattainment for PM_{10}. The status was upgraded from moderate to serious in February 2001, based on 1999 violations of the 24-hour standard and previous violations in the early 1990s. The last 24-hour exceedance prior to the 1999 violation was in January 1993. Washoe County has not exceeded the national $PM_{2.5}$ data in the four years that air quality monitoring has been conducted (NDEP 2003).

On June 5, 1998, the USEPA reclassified Washoe County from nonattainment to attainment for the one-hour ozone standard. After the eight-hour ozone standard was challenged in the courts, the USEPA reinstated Washoe County's nonattainment status for the one-hour ozone standard, effective December 20, 2000 (NDEP 2001). Washoe County exceeded the one-hour ozone concentration in 1990 but has not done so again through 2002, the most recent year data are available from NDEP. Additionally, the county did not exceed the 8-hour concentration between 1997 (the first year 8-hour data were collected) and 2002 (NDEP 2003).

Sensitive receptors are population groups or land uses that may experience greater magnitude health effects as a result of exposure to pollutants. Examples of sensitive receptors include children, the elderly, and the chronically and acutely ill. Sensitive receptor land uses include hospitals, schools, playgrounds, convalescent and retirement homes, and residences.

Regulatory Considerations

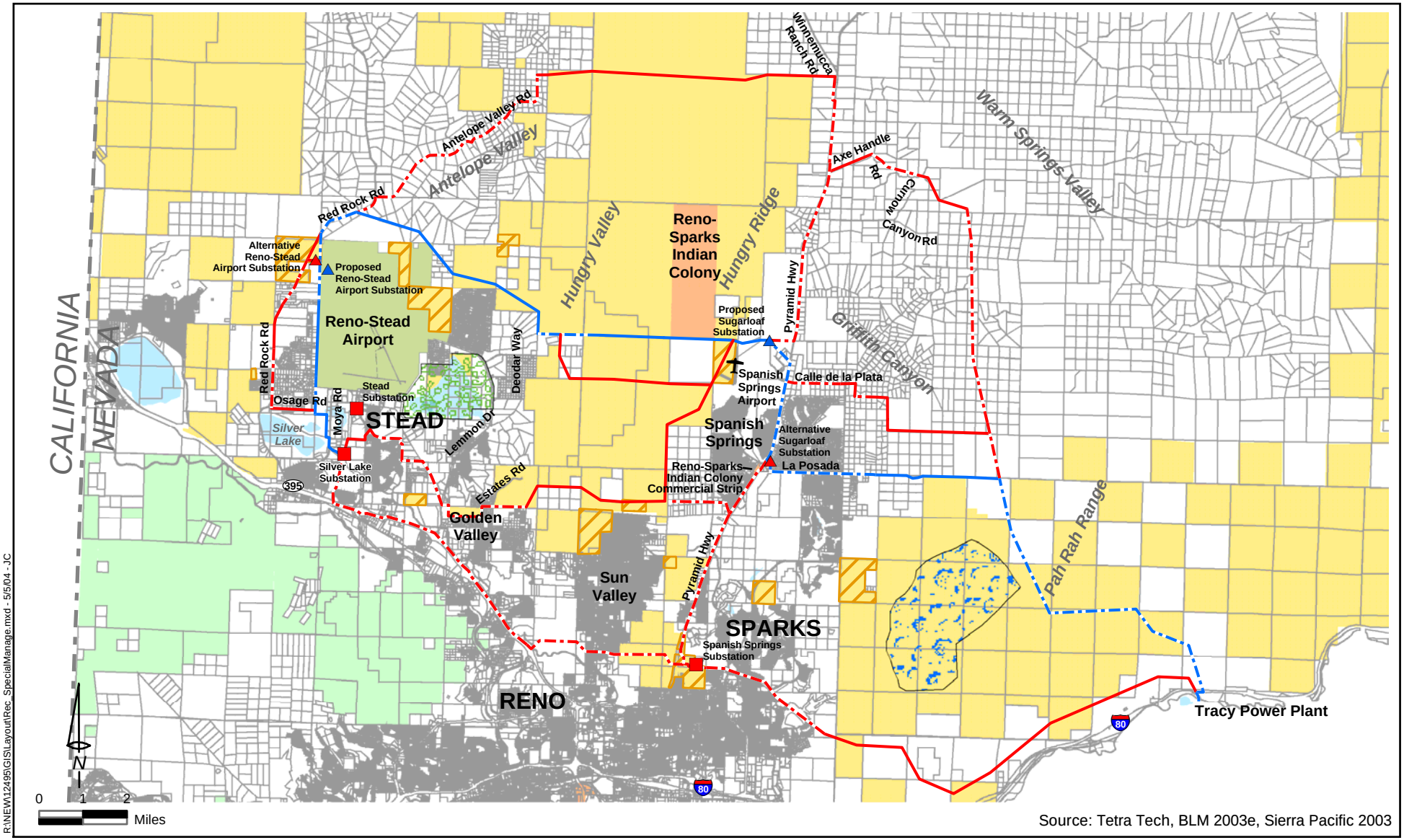
Section 176(c) of the Clean Air Act, USC § 7506(c), requires federal agencies to ensure that actions undertaken in nonattainment or maintenance areas be consistent with the Clean Air Act and with federally enforceable air quality management plans (SIPs).EPA has promulgated separate rules that establish conformity analysis procedures for transportation-related actions and for other (general) federal agency actions. The EPA general conformity rule applies to federal actions (including federally funded or approved actions) occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds, or de minimis levels. Because the Proposed Action or its alternatives would occur in nonattainment areas, the applicable de minimis levels are 100 tons per year of ozone precursor emissions (NOx and ROG), 100 tons per year of carbon monoxide, and 70 tons per year of PM_{10}. Note that only the Southern, Foothills, and Existing Corridors Alternatives traverse the CO and PM_{10} nonattainment areas; the remainder of the alternatives, including the Proposed Action, are subject only to the ozone precursor de minimis levels.

RECREATION AND AREAS OF CRITICAL ENVIRONMENTAL CONCERN

This section is a description of recreational resources and areas, and special management areas, such as areas of critical environmental concern (ACECs) Recreation and special management areas within the project area are shown on Figure 3-9.

Recreation

The CCFO manages all public lands in the project area. Public lands provide valuable open space in and close to the Reno metropolitan area. As such, these lands receive considerable use for diverse dispersed recreational activities, such as hiking, mountain biking, cross-country skiing, horseback riding, hunting, OHV use, and target shooting (BLM 2002f).



Source: Tetra Tech, BLM 2003e, Sierra Pacific 2003

Public lands within the project area are used for diverse dispersed recreational activities. The Pah Rah High Basin Petroglyph District and the Swan Lake Nature Study Area are the only two designated ACEC lands in the project area that require special management to protect important natural, cultural, or scenic resources or to identify natural hazards.

Legend

Routes
- Proposed Route
- Proposed Route (incorporating existing line)
- Alternative Route
- Alternative Route (incorporating existing line)

Substations
- Existing Substation
- Proposed Substation
- Alternative Substation

ACEC
- Swan Lake Nature Study Area
- Pah Rah High Basin Petroglyph

Land Status
- Bureau of Land Management
- Native American Reservation
- Private
- County/City Parks
- US Forest Service
- Airport Authority of Washoe County
- Public Lands Designated for Recreation/Public Purposes
- Water

Tetra Tech, Inc

Recreation and Special Management Areas

Tracy to Silver Lake
120 kV Transmission Line

Figure 3-9

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OHVs used in the planning area include trail motorcycles, all-terrain vehicles (i.e., vehicles used on and off existing roads and trails, such as four-wheelers and three-wheelers), and four-wheel drive vehicles (e.g., jeeps). All public lands under the Southern Washoe County Urban Interface Planning Area are designated as limited OHV areas, unless they are specifically designated as open or closed. In limited areas, OHV use is restricted to existing roads and trails. Designated open OHV areas are the Hungry Valley north and west of the Reno-Sparks Indian Colony and a small area in the Lemmon Valley, north of Swan Lake. Regardless of designation, OHV use is prohibited in or through the immediate vicinity of any surface water source; in any riparian area; in any channel bank or streambed of a perennial stream; and in threatened or endangered plant locations. Additionally, seasonal closures to OHV use apply in areas surrounding all occupied raptor aeries (nests) between March 1 and June 15 annually.

Organized events on public land require coordination with the BLM and the issuance of an event-specific permit. The following organized recreational activities occur on BLM land within the Hungry Valley, in the vicinity of the project area (Hull 2000; Knight 2002):

- The Reno Radio Control Model Airplane Club leases approximately 10 acres near the study area.
- Motorcycle races occur approximately four to five times per year in the project area and are generally restricted to existing roads and trails. Start areas for races are generally on the east side of Hungry Valley.
- Hunting dog field trials occur near the study area. Approximately 20 to over 100 participants compete at the field trials. Dog trials require large tracts of unobstructed land, and participants use horses to cover the distances.
- Equestrian events in the project area include endurance races and pleasure riding. There are usually two or three organized endurance races each year. The races typically start at Chickadee Drive on the west side of the valley or near Winnemucca Ranch Road.
- "Coyote chases" are another dog sporting activity that occurs near the project area. Coyote chases require large open areas where participants run little risk of conflicting with other activities, particularly motorized sports.
- The Boy Scouts of America occasionally hold jamborees in Hungry Valley, which involve from 80 to over 200 Boy Scouts and adult supervisors.
- During June, the Reno Rodeo Cattle Drive goes from Doyle, California, through Hungry Valley to Reno.

Hunting

The BLM manages habitat on public lands to protect or improve it for aquatic and terrestrial wildlife through coordinated resource and habitat management programs. The NDOW is primarily responsible for resident wildlife populations and administration of hunting. The project area is within NDOW's western region, Game Area 2 (NDOW 2002). Game Unit's within the project area include Unit 021 (generally west of Pyramid Highway), Unit 022 (generally east of Pyramid Highway), Unit 196 (generally south of Highway 395 and north of Interstate 80), and Unit 195 (generally east of Highway 395 and south of Interstate 80). Most of the project area is in Unit 021 and is administered by the BLM.

State of Nevada

There are no state parks in the project area.

Washoe County

Washoe County Parks and Recreation maintains approximately 70 facilities in the county, totaling over 6,000 acres (NDOSP 2002). These facilities include parks, trails, open space, bikeways, and athletic facilities. Washoe County Parks and Recreation offers a wide variety of recreational services, including hiking, camping, fishing, swimming, target shooting, and horseback riding,

and also presents amphitheater programs. The Proposed Action and alternative ROWs do not traverse any county parks.

There are several tracts of BLM land in the project area that have been designated for disposal through the Recreation and Public Purposes Act for state and local governments to use for recreation (Figure 3-9). For example, the lands designated for disposal at the Spanish Springs Airport lease location have been added to the Recreation and Public Purposes designation. The airport lease will continue until such time as the airport is not compatible with the surrounding development or when interest in continued airport operation ceases. These lands will then be managed to be consistent with a Recreation and Public Purposes designation (BLM 2001).

The Airport Authority of Washoe County manages the Reno-Stead Airport, which is in the western portion of the project area (Figure 1-1). The airport has been the location of the National Championship Air Races and Air Show since 1965, which is staged annually in September by the Reno Air Racing Association, Inc. It is the only event in the world to feature air racing by multiple classes of aircraft. The event drew 222,000 visitors in 2002 (Reno Air Racing Association, Inc. 2003).

Areas of Critical Environmental Concern

FLPMA requires that priority be given to designating and protecting ACECs through BLM's resource management planning process. An ACEC designation is the principal BLM designation for public lands where special management is required to protect important natural, cultural, or scenic resources or to identify natural hazards. Therefore, BLM managers give precedence to identifying, evaluating, and designating areas that require special management attention during resource management planning. In addition to ACECs, the BLM can designate other special management areas, such as Nature Study Areas. With in the project area, there is the Pah Rah High Basin (Dry Lakes) Petroglyph District ACEC and the Swan Lake Nature Study Area (Figure 3-9).

SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This section provides an overview of the population, housing, employment, economic, and environmental justice characteristics of Washoe County, the site of the Proposed Action and potential region of influence for socioeconomic effects. The described socioeconomic factors provide context for analyzing the potential effects that could result from project construction and operation, such as effects on population increases, housing availability, and property values, employment and income growth, and public services.

Population

Population and associated housing are presented within Washoe County. Described in this section are the current population estimates, recent population growth rates, and the projected future population for Washoe County. Housing occupancy, vacancy, and current inventory details are provided, along with detailed information on the current prices and expected outlook for housing in Washoe County.

Population within Washoe County grew 33.3 percent in the decade between 1990 and 2000 from 254,667 to 339,486. Table 3-9 provides the percent change in population for Washoe County, the state of Nevada, and for the US between 1990 and 2000. Nevada recorded the highest rate of population change (a 66.3 percent increase), when ranked among all of the states (US Census Bureau 2001a). The total population change in the US from 1990 to 2000 was 13.1 percent, which was much lower than the 33.3 percent increase in Washoe County and the 66.3 percent increase throughout Nevada (US Census Bureau 2002).

As of July 2001, the population of Washoe County was estimated at 353,336 (US Census Bureau 2002). From April 2000 to July of 2001, population increases in the state (5.4 percent) and Washoe county (4.1 percent) continued to exceed the 1.2 percent increase throughout the US (US Census

Table 3-9
Population Summary for Washoe County

	Washoe County	Nevada	United States
Population, 2001 estimate	353,336	2,106,074	284,796,887
Population percent change, April 1, 2000, to July 1, 2001	4.1	5.4	1.2
Population, 2000	339,486	1,998,257	281,421,906
Population, 1990	254,667	1,201,833	248,709,873
Population, percent change, 1990 to 2000	33.3	66.3	13.1

Source: US Census Bureau 1991, 2001b, 2002.

Bureau 2001b, 2002). The reasons for the high rates of population growth in Nevada have been identified as a combination of moderately priced housing, low overall taxation rates, low cost of living, and an expanding economy.

Historically, Reno and Sparks have been the primary population centers of Washoe County. In 2000, within Washoe County, 73 percent of the population was concentrated in those two cities (53 and 20 percent of the total population in the county, respectively), and 28 percent were in other areas of Washoe County (US Census Bureau 2001c). Based on the historic growth of population in Reno and Sparks and the focus of the Reno/Sparks area for employment, housing, and shopping, most of Washoe County's foreseeable population increase is predicted to occur in the Reno/Sparks area.

Future population growth in Nevada is projected to remain very high, with the Nevada state demographer predicting that from 1999 to 2010 the Washoe County population will increase by 381,300 people. For a projection beyond 2010, Washoe County staff have compiled population estimates identifying population levels in 2018 ranging from a low of 380,300 to a high of 455,740 (Washoe County 2000a). For a rapidly expanding area, future population levels are difficult to accurately project. Using a range of population estimates for planning illustrates the speculative nature of population projections and emphasizes the need to plan incremental increases to public services and other demand-based infrastructure and service needs.

Occupied housing units in Washoe County increased by 29.1 percent from 1990 to 2000, as displayed in Table 3-10. During the same period, the number of occupied housing units in Nevada increased by 61.1 percent and the number of occupied housing units in the US increased by 14.7 percent. The percentage increases in the number of occupied housing units is similar to the percentage population increases for Washoe County and Nevada, indicating that housing supply in Washoe County nearly matched the population increases during the 1990s. Table 3-11 provides a comparison of the 8.2 percent of vacant housing units in 2000 for Washoe County with the vacancy rates for Nevada, the western US, and the national averages (US Census 2001d, 2002). A vacancy rate of approximately five percent typically indicates an adequate vacancy rate for people seeking housing and provides property owners with an acceptable market for renting and selling residential properties.

Housing values in Washoe County were approximately 13 percent higher than the state and national averages in 2000. The median value of Washoe County owner-occupied housing in 2000 was $161,000. Median values in Nevada were approximately $142,000 in 2000 and approximately $119,000 throughout the US. The percentage of owner-occupied housing in a region can be an indicator of housing affordability. In 2000, owner-occupied housing in Washoe County was 59.3 percent, compared to the state average of 60.9 percent. Owner-occupied housing in the western US (61.5 percent) and the national average (66.2 percent)

Table 3-10
Housing Summary Washoe County

	Total Housing Units in 1990	Housing Units in 2000				Percent Change, 1990-2000				
								Occupied Units		
		Total	Percent Vacant	Occupied	Percent Owner-Occupied	All Housing Units	Vacant Units	Total	Owner	Renter
Region of Influence										
Washoe County	112,193	143,908	8.2	132,084	59.3	28.2	19.4	29.1	41.5	14.5
Comparison Areas										
Nevada	518,858	827,457	9.2	751,165	60.9	59.5	45.1	61.1	79.0	39.4
US Regions										
West	20,895,221	24,378,020	7.9	22,444,733	61.5	16.7	-1.4	18.5	23.5	11.4
Northeast	20,810,637	22,180,440	8.5	20,285,622	62.4	6.6	-2.2	7.5	9.3	4.6
Midwest	24,492,718	26,963,635	8.3	24,734,532	70.2	10.1	2.5	10.8	14.3	3.4
South	36,065,102	42,382,546	10.3	38,015,214	68.4	17.5	2.9	19.5	23.3	11.9
United States	102,263,678	115,904,641	9.0	105,480,101	66.2	13.3	1.0	14.7	18.3	8.3

Source: US Census Bureau 2001a, 2001d.

Table 3-11
Full-Time and Part-Time Industry Employment Summary

Employment by Place of Work	Washoe County					United States		Nevada	
	1990	Percent of 1990 Total	2000	Percent of 2000 Total	Percent Change 1990-2000	Percent of 2000 Total	Percent Change 1990-2000	Percent of 2000 Total	Percent Change 1990-2000
Total full-time and part-time employment	176,549	100	240,785	100	36.4	100.00	20.1	100.00	65.1
Employment by industry									
Farm employment	459	0.26	689	0.29	50.1	1.85	-1.6	0.43	4.2
Nonfarm employment	176,090	99.74	240,096	99.71	36.3	98.15	20.6	99.57	65.5
Private employment	**157,410**	**89.16**	**217,479**	**90.32**	**38.2**	**84.57**	**23.1**	**89.37**	**68.5**
Ag. services, forestry, fishing,	1,119	0.63	2,166	0.9	93.6	1.29	49.1	1.06	116.1
Mining	1,882	1.07	953	0.4	-49.4	0.47	-23.8	1.03	-18
Construction	9,949	5.64	17,607	7.31	77	5.74	32.3	8.20	79
Manufacturing	9,371	5.31	14,870	6.18	58.7	11.41	-3	3.75	67.7
Transportation and public utilities	10,638	6.03	13,664	5.67	28.4	4.92	25.6	4.87	74.4
Wholesale trade	9,402	5.33	13,620	5.66	44.9	4.53	13	3.32	61.9
Retail trade	28,495	16.14	36,928	15.34	29.6	16.33	19.3	16.00	72.1
Finance, insurance, and real estate	13,784	7.81	24,212	10.06	75.7	8.06	26	9.41	127.4
Services	72,770	41.22	93,459	38.81	28.4	31.81	37.6	41.74	59.3
Government and government enterprises	**18,680**	**10.58**	**22,617**	**9.39**	**21.1**	**13.58**	**7.3**	**10.19**	**43.1**
Federal, civilian	3,110	1.76	3,269	1.36	5.1	1.73	-10.6	1.21	24.9
Military	828	0.47	710	0.29	-14.3	1.24	-23.7	0.92	-12.5
State and local	14,742	8.35	18,638	7.74	26.4	10.61	16.6	8.06	58
State	5,386	3.05	5,851	2.43	8.6	2.96	12.4	2.04	31.1
Local	9,356	5.3	12,787	5.31	36.7	7.66	18.3	6.02	69.9

Source: BEA 2002

indicate that Washoe County owner-occupied housing is slightly less affordable than many other areas. Wages and housing prices are the primary determinant of housing affordability (US Census 2001d, 2002).

Employment and the Economy

Employment and general economic characteristics describing current employment levels, employment trends, income levels, and the provision of public services are discussed for Washoe County. These descriptions serve as background information for analyzing economic effects of the Proposed Action.

Employment characteristics of Washoe County in 1990 and 2000 are detailed in Table 3-11, along with comparison data for Nevada and the US. In 2000, total Washoe County employment included 240,785 jobs, with 90.32 percent of the jobs in private employment and 9.39 percent in government employment. Retail trade, services, and finance/insurance/real estate were the three leading private employers, with a combined total of 64 percent (BEA 2002).

The composition of large employment sectors within a region and changes over time to the various sectors provide an indication of the growth and decline of industry types and the economic activity associated with an industry type. Between 1990 and 2000, employment levels in mining and the military decreased in Washoe County. Employment sectors from 1990 to 2000 that did not grow as fast as the 36.4 percent overall employment growth in the county included transportation and public utilities, retail trade, services, and government employment (BEA 2002). Increased employment in the construction and finance/insurance/real estate employment sectors indicate an increase in services for an expanding metropolitan area.

Unemployment rates in Washoe County since 1995 have been less than the unemployment rate for Nevada. Table 3-12 displays unemployment rates for Washoe County and for Nevada. The October 2002 unemployment rate for the US was 5.7 percent (BLS 2002).

Average income levels in Washoe County are higher than the average income levels of Nevada and the US. Table 3-13 displays per capita personal income for Washoe County, Nevada, and the US. In 2000, Washoe County per capita income levels were $34,879 and had risen by 47.8 percent from 1990. The Washoe County 2000 level of $34,879 was approximately 18 percent higher than the average per capita personal income of Nevada and the US (BEA 2002). In general, the relatively high levels of per capita personal income and strong employment growth indicate that economic activity within Washoe County is very strong and that the county is adapting to regional population and housing growth.

The Washoe County Sheriff's Department and Reno Sparks Indian Colony peace officers provide Law enforcement in the study area. The Truckee Meadows Fire Protection District encompasses the project area and unincorporated areas of Washoe County. BLM is responsible for wildland fire protection on federal land under its jurisdiction. Emergency and nonemergency ambulance service for the study area is provided by the Regional Emergency Medical Services Authority, which also provides air transport within a 150-mile radius of Reno (BLM 2001a).

Table 3-12
Unemployment Trend Summary

	Washoe County	Nevada
Annual average 1995	4.7	5.4
Annual average 2000	3.0	4.1
Annual average 2001	4.1	5.3
October 2002	3.5	4.5

Source: Bureau of Labor Statistics 2002a, 2002b

Table 3-13
Washoe County Ancestry Characteristics, Year 2000

Reporting Group	Washoe County Percentage	State of Nevada Percentage	United States Percentage
White [1]	80.4	75.2	75.1
Black or African American	2.1	6.8	12.3
American Indian and Alaska Native	1.8	1.3	0.9
Asian	4.3	4.5	3.6
Native Hawaiian and Other Pacific Islander	0.5	0.4	0.1
Persons reporting some other race	7.7	8.0	5.5
Persons reporting two or more races	3.3	3.8	2.4
Hispanic or Latino origin[2]	16.6	19.7	12.5
White, not of Hispanic/Latino origin	73.0	65.2	69.1

Source: US Census Bureau 2002.

[1]Includes persons reporting only one race.

[2]Hispanics may be of any race so also are included in applicable race categories.

Environmental Justice

In February 1994, President Clinton signed Executive Order 12898, requiring all federal agencies to seek to achieve environmental justice by "... identifying and addressing effects of its programs, policies, and activities on minority and low-income populations." This section provides an overview of minority and low-income populations in the project area. Within the study area, the Reno Sparks Indian Colony was identified as a potential area for minority or low-income population, based on the proximity of the proposed route to the Reno Sparks Indian Colony (Figure 1-1). After Washoe County parcel size data and development patterns were reviewed, no areas other than the Reno Sparks Indian Colony were evaluated for potential impacts to minority or low-income populations (US Census Bureau 2002).

Non-white racial groups are typically referred to as minority populations within the context of environmental justice analysis. Minority population characteristics within Washoe County are presented in Table 3-14. Within Washoe County, the 2000 Census identified the white population as being approximately 80 percent of the entire county population. In the context of analyzing the proposed project for potential effects on minorities, any area containing a minority population greater than 50 percent of the total population or containing a minority population meaningfully greater than the minority population in Washoe County would be identified as a minority population within the project area. The Reno Sparks Indian Colony is composed of approximately 94 percent American Indians, indicating that a minority population does exist adjacent to the proposed transmission line route (US Census Bureau 2002).

Within Washoe County, approximately 10 percent of people lived below the poverty level in 1999. Within the Reno Sparks Indian Colony, approximately 20 percent of the people lived below the poverty level in 1999, the year for which the most current census data is available (US Census Bureau 2002). The high poverty rate within the Reno Sparks Indian Colony indicates that a low-income population does exist adjacent to the proposed transmission line route.

CULTURAL RESOURCES AND PALEONTOLOGY

Cultural resources are locations of human activity, occupation, or use. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses and locations of traditional cultural or religious importance to specified social or cultural groups.

Table 3-14
Minority Population Characteristics

Reporting Group	Washoe County Percentage	State of Nevada Percentage	United States Percentage
White [1]	80.4	75.2	75.1
Black or African American	2.1	6.8	12.3
American Indian and Alaska Native	1.8	1.3	0.9
Asian	4.3	4.5	3.6
Native Hawaiian and Other Pacific Islander	0.5	0.4	0.1
Persons reporting some other race	7.7	8.0	5.5
Persons reporting two or more races	3.3	3.8	2.4
Hispanic or Latino origin[2]	16.6	19.7	12.5
White, not of Hispanic/Latino origin	73.0	65.2	69.1

Source: US Census Bureau 2002.

[1]Includes persons reporting only one race.

[2]Hispanics may be of any race so also are included in applicable race categories.

Cultural resources as discussed in this section particularly include districts, sites, buildings, structures, and objects listed on or eligible for the National Register of Historic Places (NRHP). Eligible properties can include sites of traditional religious and cultural importance to Indian tribes. A traditional cultural property (TCP) is a site of traditional religious and cultural importance to a tribe and which is eligible for the NRHP.

The cultural resource component of the environment is defined here to include several classes of properties. Each class is described briefly, and its legislative authority is cited.

- *Properties listed on or eligible to be listed on the National Register of Historic Places (National Historic Preservation Act [NHPA]).* Historic properties may include sites, buildings, structures, objects, districts, traditional cultural properties, or landscapes that are prehistoric or historic or that relate to an ethnographic group.
- *Archaeological sites (Archaeological Resources Protection Act [ARPA], Archaeological Data Protection Act [ADPA]).* ARPA states that archaeological data cannot be excavated before a permit is issued. ADPA requires agencies to report impacts that projects may have on archaeological, historical, and scientific data and requires that the agencies recover such data.
- *Native American religious practices and spiritual places (American Indian Religious Freedom Act and Executive Order 13007).* EO 13007 requires federal agencies to accommodate access to sacred sites by Native American religious practitioners, to avoid adverse effects on such sites, and to maintain site information in confidence.
- *Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony (Native American Grave Protection and Repatriation Act).* Lineal descendants and traditional religious leaders must be consulted before human remains, funerary and sacred objects, and objects of cultural patrimony are disposed of or repatriated.

The project vicinity has been occupied for approximately 12,000 to 13,000 years, including terminal prehistoric and historic use by the Washoe band and at least two Northern Paiute bands and post-contact historic activity centered on transportation development, mining, and ranching.

Prehistoric Archaeological Resources

In the absence of a written historical record, information about lifeways in the project area prior to Euro-American contact is primarily based on the archaeological record. Prehistoric archaeological resources in the project area include isolated artifacts (isolates), habitation sites with associated middens, temporary camps, activity sites, quarries, and rock art. Archaeological studies in the project area have defined distinct periods of human habitation: the Terminal Pleistocene/Early Holocene (up to 7,000 years before present [BP]), and the Archaic, which is divided into Post-Mazama (7,000 to 5,000 years BP), Early Archaic (5,000 to 3,500 years BP), Middle Archaic (3,500 to 1,300 years BP), Late Archaic (1,300 to 600 BP), and Terminal Prehistoric (600 BP to Euro-American contact). These periods are distinguished by the types, design, complexity, and location of artifacts, and archaeological sites specific to each period. Sites in the project area represent a diverse archaeological record, including small lithic scatters, large habitation sites with ground stone and constructed features, and rock art.

Prior to Euro-American contact, Terminal Prehistoric occupation of the western Great Basin is generally thought to be associated with the contraction of Washoe territory and the arrival of Numic-speaking peoples, who entered the area from a homeland near the southern Sierra Nevada (Bettinger and Baumhoff 1982; Delacorte 1995; Madsen and Rhode 1994 and references therein). Early band-like groups residing in large villages seem to have been replaced by family or household units living in independent camps, much like those reflected in the ethnographic record. Although large camps were common in the Washoe area of Carson Valley, the general pattern was one of independent households moving from one resource area to the next and a more intensive use of a circumscribed landscape.

Historic Overview

Euro-Americans began arriving in northwestern Nevada in the mid-1820s with fur trapping expeditions to the region. By the mid-1840s, explorers and overland immigrants were seeking alternative routes through the region on their way to the Oregon Territory. Thousands traveled along the Humboldt River and Truckee River corridors in the 1850s on their way to the California gold rush, and again, in a reverse direction, in the 1860s as part of the "Rush to Washoe." In 1868, the United State's first transcontinental railroad, the Central Pacific Railroad, established a depot and freight platform at Lake's Crossing, now Reno. The settlement was soon platted, lots were sold, and a small town began to develop. By the 1870s, ranching settlements appeared in Winnemucca Valley just north of Truckee Meadows. Responding to federal public land entry laws throughout the late nineteenth and early twentieth centuries, homesteaders and settlers expanded agricultural fields from the floodplains to outlying dry lands, importing water through irrigation systems. Ranching and homesteading extended from well-watered areas, such as the Truckee Meadows, into surrounding foothills. Agricultural communities developed along wagon routes, and regional mercantile centers grew with the arrival of the railroads.

The first railroad into the project area itself was the Nevada-California-Oregon Railway, beginning in Reno and running to the Honey Lake region, completed as far as Amedee Hot Springs by 1890. During this same period, and into the 1920s, the Western Pacific Salt Lake City-Oakland Line and the Southern Pacific Fernley-Lassen Line expanded to connect local centers with regional and national markets. This expansion supported existing agricultural enterprises and encouraged other industries to develop.

By 1865, the Surprise Valley Road had been established between the Truckee Meadows in Nevada and Surprise Valley in northeastern California (Mikesell 1995). The Surprise Valley Road ran from the Truckee River north through Spanish Springs Valley, then through Winnemucca and Warm Springs valleys, over to Honey Lake, then north to Surprise Valley (Mikesell 1995).

Once the Idaho gold rush had subsided, the road to Surprise Valley was far less traveled. In 1872, William M. Anderson registered a section of this same route as a toll road, running between Fish Springs (at the south end of Honey Lake) and Reno's North Mill or the Glendale Hotel, located just east of Reno. The toll road followed the same route as the Surprise Valley Road, and from the 1880s was most commonly known as the Winnemucca Valley Road. By 1880, Anderson had sold the road to Washoe County, and it remained in use until at least 1908 (Mikesell 1995).

At the northern end of Spanish Springs Valley, various stops were established along the Anderson Toll Road. Farther south at Deep Wells, the road forked. Its eastern branch led to Spanish Springs Valley, which had early on been settled by Mexicans . A. H. Gillespie established the Spanish Springs Ranch there in 1862. Within twenty years, seven ranches existed in the valley, growing grain, alfalfa, and hay (Price et al. 1994).

Ethnographic Overview

Northern Paiute

The Northern Paiute are a Uto-Aztecan-speaking group that ranged over western Nevada and the Owens Valley portion of eastern California. Stewart (1939, in BLM 2001b) recognized several local Northern Paiute bands; two such groups made use of the study area (Johnson 1975; Park 1938; Stewart 1939, in BLM 2001b). Tasiget Tuviwarai settlement focused on the Winnemucca and Spanish Springs Valleys and lower Truckee Meadows. The Kuyuidokado occupied the area to the east, including all of Pyramid Lake and the lower Truckee River. The Northern Paiute were semi-nomadic, moving between environmental zones to take advantage of resources as they became available (BLM 2001b).

Movement occurred laterally, from one valley to another, and elevationally, moving up the valley edges. Lifeways varied according to type and abundance of resources available within a group's territory. In some areas, subsistence revolved around lakes, and a semi-sedentary settlement pattern was possible. In most areas resources were more dispersed and settlement was less sedentary (BLM 2001b).

The annual round was somewhat consistent from group to group (see Johnson 1975, and Fowler and Liljeblad 1986). Winters were spent in multifamily villages, composed of three to ten houses. Winter houses included a conical pole framework built around a shallow depression and covered with tule mats. During spring and summer, small groups moved away from the winter village. They roamed widely, residing in camps located near resource concentrations. Plants provided most of their subsistence, although in some locations, fishing was important. Later in the fall, some groups traveled to areas where pine nuts could be collected. Fall also was the preferred hunting season. Mountain sheep and deer were hunted, and antelope were taken in communal drives. With the onset of winter, groups once again congregated and lived off stores assembled over the summer and fall (BLM 2001b).

Northern Paiute social organization was structured around two groupings. The first was the extended family, which functioned alone for much of the year. The second was larger band settlements that were fluid in size and composition. Such settlements formed for communal activities, such as spring fish runs, summer caterpillar harvests, and fall pine nut harvests and rabbit drives. It was common for several family units to winter together (BLM 2001b).

The Washoe

The Washoe, a Hokan-speaking hunting and gathering group, inhabited the chain of valleys along the eastern slope of the Sierra Nevada, from Honey Lake to Antelope Valley (Downs 1961; Price 1963, in BLM 2001b). The Pine Nut Mountains and the Virginia Range formed the eastern boundary of Washoe territory, while the western boundary extended beyond the Sierra crest (BLM 2001b).

Washoe territory tended to be well watered, allowing for a more consistent subsistence and settlement pattern. Washoe subsistence still involved seasonal shifts in resource selection and concomitant settlement location. With the coming of spring, small bands or individual families left their winter base camps to take advantage of ripening plant foods in low-lying valleys. As soon as the snow melted, people began moving to higher elevations in the Sierra Nevada. By early June, most Washoe were at Lake Tahoe encampments, there to take trout, sucker, and whitefish spawning in the streams emptying into the lake (Downs 1961, in BLM 2001b). Stores of dried fish were developed for later use (BLM 2001b).

In the late summer and early fall, Washoe left Lake Tahoe and dispersed in small groups to the valleys east of the Sierra. Antelope and rabbit were hunted in early fall, both by individuals and in communal drives. Rabbits were dried for winter use. During late fall, the Washoe collected pine nuts along the eastern face of the Sierra and in the Pine Nut Hills; deer hunting was an important ancillary activity in these locations. With the onset of heavy winter storms, Washoe families returned to their favored base camps along the Carson and Truckee Rivers, where they subsisted on stored pine nuts, seeds, and dried meat (Downs 1961, in BLM 2001b; BLM 2001b).

The basic Washoe social and economic unit was a household composed of a married couple, their dependent children, and one or more relatives or close friends (Price 1963; Downs 1961, in BLM 2001b). Each household occupied a *galis dangal*, or winter house, that was 13 to 16 feet in diameter and had an east-facing doorway and a central hearth. A winter base camp contained two to ten such houses (BLM 2001b).

Inventories

Inventory Methods

Far Western Anthropological Research Group, Inc. completed a cultural resources inventory of proposed and alternative project corridors on public lands and on private land parcels where rights-of-entry have been granted. The inventoried area also includes access roads, lay-down areas, and extra-space work areas designated for the proposed corridor.

In consultation with the BLM, the area of potential effect (APE) was determined to be a 300-foot corridor along all study alternatives; portions of the APE were expanded to 600 feet to provide construction flexibility in areas of rough topography. The APE for all access roads was determined to be 35 feet wide along the access road alignment.

Findings

The archival records search revealed that a significant amount of cultural resource studies had taken place along the project corridor. These studies include archaeological surveys associated with urban/suburban development, utilities development, agricultural/irrigation improvements, local and regional transportation projects, and academic studies. In total, the APE for the Tracy to Silver Lake Transmission Line crosses or passes within half a mile of 148 previous study areas. Eighty of these studies resulted in the discovery of one or more archaeological sites.

Two hundred thirty-three sites were previously recorded within half a mile of the project corridors where large-scale housing developments have resulted in intensive surveys and archaeological testing and evaluations. The total number of sites represents a diverse archaeological and historic record, including small lithic scatters, large habitation sites with ground stone and constructed features, rock art, historic mining prospects, irrigation structures, ranch facilities, historic road segments, and railroads.

There are 49 previously documented cultural resources within the project APE. Thirty sites have been determined ineligible for listing on the National Register of Historic Places, eight are unevaluated, and one has been determined to be eligible—a historic irrigation ditch. The Nevada-California

Oregon Railroad is eligible for listing on the National Register, but the segments that intersect the area have already been determined to not contribute to the overall eligibility of the railroad.

A physical inventory of the project alternatives resulted in the new discovery of 57 prehistoric sites, 29 historic-era sites, 5 mixed component (prehistoric and historic) sites, and 94 isolated finds (isolates). Isolates are not eligible for listing on the National Register. Until the BLM and SHPO are finished with consultations, the following information is tentative: Of the 91 total sites newly identified within the project APE, 79 are recommended ineligible for the NRHP because they lack contexts, artifact assemblages, settings, or themes appropriate for addressing the criteria for potential nomination. Eleven of the newly discovered sites remain unevaluated pending further archaeological testing. These include ten prehistoric sites and one historic site that show the potential for buried stratigraphic contexts or artifact assemblages and features useful for addressing research questions significant to local prehistory and history. Eight of the previously documented sites, seven historic and one prehistoric component, remain unevaluated pending further study.

Native American Concerns

Native American Religious Concerns/Trust Responsibilities

In accordance with provisions of the National Historic Preservation Act, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act, the BLM has initiated consultation with the Reno-Sparks Indian Colony, the Pyramid Lake Paiute Tribe, and the Washoe Tribe of Nevada and California. Native Americans are concerned with the public distribution of information regarding the location and nature of many traditional places. Specific information provided to the BLM has been held as confidential. Given the sensitivity of this issue, the current analysis addresses types of resources rather than specific resources (BLM 2001b).

Information on Northern Paiute and Washoe religious beliefs can be found in a number of sources, including Fowler and Liljebald 1986; d'Azevedo 1986; ITC 1976a, 1976b; Fowler and Fowler 1974; Hultkranz 1976; Park 1934, 1938; Stewart 1941, 1944; Olofson 1979, Whiting 1950; Leis 1963; Siskin 1983; Freed and Freed 1963; Downs 1961; and Dangberg 1968. The information presented below was drawn from these sources.

Religions of Native American groups in the Great Basin exhibit a strong association with the earth. Practitioners believe the earth, with all of its biophysical components, to be a living being. Ethnographic information indicates that Northern Paiute and Washoe occupied the study area, and their way of life is characterized by the concept of living in harmony with the natural environment. Rituals and ceremonies address the need to ensure that plants, animals, and physical elements flourish. The continued welfare of the people depends on these rituals and ceremonies being performed properly. The manner of performing the rituals and ceremonies, the places at which they are performed, and perhaps even the time of their performance are often prescribed.

A central feature of their religious belief is that supernatural power has permeated the earth since its creation. Religious behavior revolves around the acquisition of this power. Sources of power are numerous, including water bodies, prominent mountain peaks, and caves. Animals and, to a lesser extent, plants have power that can be conveyed to people by supernatural spirits who control individual species.

Religious expression takes several primary forms: ceremonies, individual prayer, and use of power spots for vision questing, curing, and doctoring. The most frequent form of expression is the individual prayer. Prayers are made to the spirits and were especially important in connection with places where spirits may live or places regarded as power spots.

Native American Consultation

This is an ongoing process being conducted by BLM staff. BLM has initiated consultation with the Reno Sparks Indian Colony, the Pyramid Lake Paiute Tribe, and the Washoe Tribe of Nevada and California. To date there is one known area of cultural and religious importance to Native Americans in the project area, located in southern Hungry Valley near the alignment of the Proposed Action. As the consultation process continues, information may be made available regarding the possible existence of other such sensitive resources in the project area.

Paleontological Resources

Paleontological resources are fossilized remains and imprints of multicellular plants and animals. Such remains can be significant sources of scientific information, particularly if they are rare or particularly well preserved.

FLPMA requires that resources of scientific value be preserved, and the BLM Paleontological Resource Management Program requires the BLM to:

- Locate, evaluate, manage, and protect, where appropriate, paleontological resources on public lands.
- Facilitate the appropriate scientific, educational, and recreational uses of paleontological resources, such as research and interpretation.
- Ensure that proposed land uses, initiated or authorized by BLM, do not inadvertently damage or destroy important paleontological resources on public lands.
- Foster public awareness and appreciation of our nation's rich paleontological heritage (BLM Manual 8720 1998).

According to preliminary research, paleontological resources have been located in the project area on or near the alignment for the Northern Route and on or near the Existing Corridor Route (Waski 2003, personal communication with Constance Callahan, May 1, 2003).